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PORTICO—HOLY ROSARY CHURCH, DAY-
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THE ARCHITECTURAL RECORD

VOLUME XLV



NUMBER I

JANUARY, 1919

The HOLY ROSARY CHURCH DAYTON, OHIO W. L. JAEKLE, ARCHITECT



By Leon V. Solon



23, Jan. 1920, L. V. Solon
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THE HOLY ROSARY CHURCH, by Mr. Jaekle, raises an interesting question. This focuses itself on the genesis of a quality not unfrequently discernible in works of this type; a quality which may result either from an enthusiastic appreciation of the physical beauty of historic examples studied, or, in rare instances, from an unconscious exposition of vital social tendencies. Wherein lies the powerful appeal of Cinquecento architecture to so large a proportion of American architects? In no other style has the American architect expressed himself so fluently and so spontaneously, free from the archaeological restraint that fetters the majority of his Gothic essays, or the consciousness of mathematical precision that too often oppresses his classic dreams. The reason may lie deeper than the obvious fact that the Cinquecento happens to be a congenial vogue.

During the evolution of the main types

of architecture, social conditions existed of such force as to influence the imagination of those creating the highest types—to cause a reflection of social tendencies to shine behind the conception of the work; among other reflections can be clearly seen the extent to which the people shared, or were excluded from, the privileges of mental culture.

In the most ancient types of civilization—in Assyria, India and Egypt—architecture contrived impenetrable barriers—impressive, awe-inspiring and mysterious—to separate the mass of the nation from the jealously guarded resources of knowledge, secreted as a perquisite of caste.

With the development of the power of Greece a complete revulsion in the basic idea of access occurred, due entirely to a new state of mind, evolved through the advent of the democratic form of government. In this new social order, the pioneers of advanced and intricate phi-

losophies brought their argument to the market places, and the temples even were shorn of their mystery. The demand that all spaces in public buildings of almost every type should be accessible to the citizen now controlled the plan, and the design of the exterior underwent just as radical a spiritual change, from the air of mystery to that of frankness and freedom.

The Romans, the "nouveau riches" of antiquity, venerated senior civilizations, and might for many reasons have been attracted by the completeness of Egyptian culture and the colossal character of Egyptian art, to the extent of adopting them as models; but, as their instincts were primarily democratic, they were irresistibly drawn to the Greek type of civilization, finding in the aims of that race their own attitude toward human liberties acting as a formative influence in architecture and the arts.

After the temporary obliteration of all civilization by the Teutonic races in the early centuries of our era, culture had the opportunity to start afresh. With the evolution of the Gothic era we are enabled to observe again the result of intellectual segregation in the clerkly class, and the resultant reaction on the temperament of those whose mission it was to give architectonic expression to the beliefs and prejudices of their day. An impression had to be imparted in their greatest work, the churches, to produce a specific state of mind in the laymen entering the edifice, a state having no relation to any arising through the routine of life, the purpose being to emphasize the remoteness of spiritual objectives from mundane pursuits.

The sixteenth century brought popular revolt against this system, culminating in the social and religious upheaval, a prominent feature of which was the demand for intellectual freedom. The movement towards intellectual democracy was very strong in Italy and enlisted in its ranks the many princely patrons of art, who demonstrated their belief that opportunity should be reserved for merit and that the capacity to excel is not an attribute of caste. The ideals of the Greek republic of letters became the favorite standards; abundant evidences of intel-

lectual freedom and the right of the individual to appraise abstract values, discovered in the classic models from which inspiration was sought, produced a powerful reaction, affecting even the outward form of concrete objects.

The opening of forbidden avenues and closed doors in the sixteenth century immediately influenced architectural design in Italy, and introduced what might be described as the "plein air" treatment, in which sunshine, atmosphere and simplicity in beauty heralded a new regime, fostering the classic ideals of intellectual democracy in Hellas.

There is no reason to assume that the American architect is less sensitive to social conditions than were his professional forebears in other lands, or less capable of reflecting them in his work. Evidence accumulates rapidly in the work of many talented members of the profession that in the selection and exposition of historic styles the individual is strongly biased by abstract and intellectual properties, to the extent of endowing his building with such qualities.

The civic structures of Greece and Rome and those of the Cinquecento, despite their grandeur and dignity, surprise us with the sentiment of their nearness to our inherent sympathies; we feel they were built for men like ourselves, who had free access and part-ownership, and that the power responsible for their inception was a prerogative of a social commonwealth; in short, these buildings radiate the sense of a "right of access."

This quality is not imaginary, but exists with such clearness and force as to justify us in making a great division of all architectural treatment; it is one of the first impressions experienced by the beholder, and may be attributed to an elementary cause—the ascendancy of an intellectual democracy in a State—for which reason it is not unlikely that the early phase of the Italian Renaissance claims so many sympathetic followers among American architects.

The Church of the Holy Rosary possesses this peculiar characteristic of Cinquecento public architecture, which we designate as the "right of access" and which, like all abstract ideas associated



PERSPECTIVE VIEW—HOLY ROSARY CHURCH,
DAYTON, OHIO. W. L. JAEKLE, ARCHITECT.

with concrete objects, is difficult to locate and particularize.

The capacity for conveying an impression of invitation to unobstructed enjoyment, possessed by public buildings at various periods, appears to be the sum total of a combination of attributes and dissimilar aims. In such buildings we can discover a conviction in their designers that public edifices, being essentially for the benefit of the masses, should express ideals of social intercourse and be intelligible in their appeal, without the aid of dilettante or apologist; that spaciousness should be independent of largeness in actual measurement; and that the attainment of physical beauty is reached through the conquest of material properties, uninfluenced by intrinsic value; for, as all substances are equally responsive to the touch of their various interpreters, esthetic value lies entirely in expression.

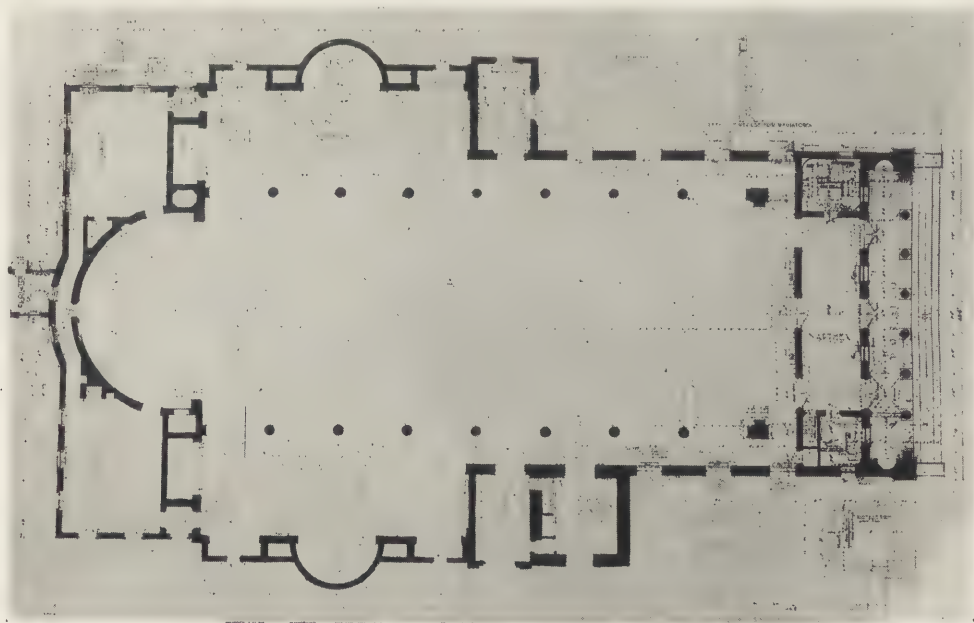
The plan of this church is well conceived and simple, with the possible criticism that the bays for the shrines might with advantage to exterior and interior have been slightly increased in size.

The exterior possesses many charms through the effective disposal of masses and spotting of shadows, which lend

themselves well to the varying perspectives. The subdivisions of the façade and the uniform scale of varied details are well adjusted and contribute an air of repose and dignity.

In his use of two contrasting tones in the structural material, Mr. Jaekle adds an interest to this edifice which recommends it to all who believe in the decorative resource available in the various methods of polychrome decoration. The majority of large buildings constructed entirely of brick, unrelieved by any other color, are monotonous and oppressive in effect. The reason for this is that the colors of fired marls are deficient in atmospheric quality, and shadows projected on this material are lacking in luminosity. This deficiency of the brick has been neutralized by Mr. Jaekle through the introduction of terra-cotta of a much lighter tone.

This method, which has frequently been resorted to, is rarely satisfactory, as most architects do not seem to appreciate that the proportion used should be decided by a rule in polychrome design. The rule is that the proportion of tone-contrast existing between the main and the accessory material determines the



FLOOR PLAN—HOLY ROSARY CHURCH, DAYTON, OHIO.
W. L. Jaekle, Architect.



DETAIL OF WEST AISLE—HOLY ROSARY CHURCH, DAYTON, OHIO.
W. L. Jaekle, Architect.

relative areas of each; in other words, as their tone values approach an equation, their areas may approach equality. This principle is understood by Mr. Jaekle, who has displayed great judgment in calculating the amount of a strongly contrasting tone value, and, in addition, has distributed and interwoven it throughout his scheme with ingenuity and success.

The impression of lightness and elegance characterizing the exterior of this church is derived to a great extent from the introduction of this lighter tone; the massiveness of the tower and the angle piers is lightened by its judicious use, without any depreciation in their apparent structural strength.

The frieze of squares and circles creates a sparkling diversion, out of all proportion to their intrinsic interest. In the pediment the six vertical bands echo the

light colored shafts of the colonnade, giving an appearance of added height and support to the pediment angle.

The manner in which Mr. Jaekle has used this additional color gives the impression that he has a temperament for tone-balance, which we hope he may soon have an opportunity to exercise in a more ambitious polychrome essay.

Unfortunately the heavy design of the rose-window detracts from an excellent façade, in which a sense of homogeneousness in scale is well established. Data on rose-windows in sixteenth century Italian churches exist in such ample measure that we might have been spared disappointment in this spectacular item; we would have wished that this window had been inspired by some such simple design as that in the Cathedral of Atri or in the parish church of Rosciolo.

At the risk perhaps of appearing



NAVE FROM SANCTUARY—HOLY ROSARY CHURCH,
DAYTON, OHIO. W. L. JAEKLE, ARCHITECT.



DETAIL OF CLERESTORY DECORATION—HOLY ROSARY CHURCH, DAYTON, OHIO.
W. L. Jackle, Architect.



DETAIL OF EAST AISLE AND TRANSEPT—HOLY ROSARY CHURCH, DAYTON, OHIO.
W. L. Jackle, Architect.



THE SANCTUARY—HOLY ROSARY CHURCH,
DAYTON, OHIO. W. L. JAEKLE, ARCHITECT.

hypercritical, we note that the cartouche in the pediment recalls the treatment of a later period than that influencing the main design; for although in an ancient building we accept a pot-pourri of many centuries, in a modern work slight variations react as a shock to scholarship. It is not improbable that the fascination of inspired stylistic expression in the ancient examples neutralizes our customary love of homogeneity.

The polychrome decorations of the interior are elaborate in detail but simple in conformation of mass, and we note in them with satisfaction the same reticence that marks the general scheme of architectural design. The architect has had the courage to keep large expanses undecorated, and has resisted the temptation to ornament the spandrels; no decoration could serve the *ensemble* as fully as these plain spaces.

The scroll motif on the chancel arch is designed with ingenuity, and the cornice frieze, derived from a Byzantine champleve enamel or mosaic, is well chosen; the enrichment on the penetrations over the clerestory windows is a good solution of an awkward problem. The color of the surface decoration is

carried to the structural detail, in the panels on the soffits and of the aisle arches.

The panel treatment of the apse wall behind the altar is excellent in its simple dignity; but the bourgeois little figures in the half dome are conceived and executed with a degree of inexperience rarely encountered in so prominent a position; they are travesties on the characters they represent.

The marble doorway reproduced conforms to the regulation formula, and is effectively relieved by the introduction of the darker marble in the panel; the paneling of the jambs is less well advised, as it appears to undermine the corbels, though we are aware that ample precedent exists for its use there.

In Mr. Jackle's work a sense of responsibility is revealed that weighs on each one who appreciates the grandeur and purity of the classics, and who uses them as a foundation for an essay. Accuracy of detail is an essential but secondary consideration; the all-important factor is an innate sympathy with the intellectual poise of the period chosen as inspiration and guidance; evidence of this we find in Mr. Jackle's work.



NARTHEX VESTIBULE—HOLY ROSARY CHURCH,
DAYTON, OHIO.

SHADOWS *of the* CHÂTEAUX



By Howard Dwight Smith

CONSIDERATION of the ethnic probabilities and possibilities incident upon the debarkation of over two millions of Americans on the shores of Europe furnishes some striking and interesting thoughts. From official sources we have been assured that numbers aggregating hardly less than a fiftieth part of the population of the United States have been transported overseas, for the most part to France. From the nature of things this fraction represents an even larger proportion of the male component of our total census figures.

There is a sort of unconscious general educational stimulus given by foreign travel which is not otherwise acquired. Foreign travel, even of the somewhat constricted and unusual nature of this great troop movement, ought to soften prejudice, both religious and political, and liberalize men's minds and broaden their general vision. Not the least interesting of the resultant effects of the presence of so many of our countrymen in France will be the influence which it will have upon our architecture.

There may be some of the two millions who go from our shores totally immune, who will return unalienated or unaffected by their travels as far as language or manners and customs go, but they will be few. A stolid, timid and uncommunicative product of a Middle West farm may go through a whole army campaign and return to his native hearth without so much as having been introduced to a single foreign habit or custom.

But only the blind or mentally deficient will fail to see and appreciate atmosphere, scenery and buildings—the material environment with which the discharge of the duties surrounds them and which it is their privilege to enjoy. As none of

these classes in general qualify for overseas service, it may be assumed that our army cannot escape the pleasure of many lovely scenes and a great many beautiful and impressive buildings.

A very interesting parallel is afforded in history. When Charles VIII. of France came to the throne in 1483 he acquired among other royal emoluments the title of King of Naples. Those were times when the divinity of kings and of worldly potentates was not as much of a liability as it is today, and autocratic royalty was not confronted on all sides by "fourteen terms" or more. He proposed to enforce his claim to the crown of Naples by marching thither with an army.

The circumstances attending his march southward were quite peculiar. He was generally received by the various and detached Italian powers, city, states, etc., as a friendly ruler, a neighbor invited hospitably to enter their domain and provinces, and was welcomed royally. His personal retinue was sumptuous and impressive, his army well organized and magnificently equipped. But his own attitude was that of a conqueror as he made his way down through the peninsula, and the conduct of his army was that of victors over the population of the cities and provinces. So he left behind him a closing wake of discontentment and unfriendliness and was forced to fight his way home through territory which had welcomed him on his outward campaign.

Politically the analogy between the expedition of Charles VIII. to Naples and that of General Pershing to France is not well drawn. Politically the expedition of Charles VIII. was a rank failure. But let us consider what were some of

the far reaching effects upon France, particularly upon its art and its architecture. By the year 1500 the Renaissance in literature had nearly run its course in Italy, but the Renaissance in painting, sculpture and architecture was nearing its height. This vast French army from the king down to the meanest camp follower, fresh from their own country, which had been but recently devastated and laid barren from revolution and civil wars, saw for the first time such things as the dramatic splendor of Venice, the palatial magnificence of Florence and the stately ostentation of Rome and Naples. M. Leon Palustre in "*L'Architecture de la Renaissance*" points out that the gardens and paintings in general appealed to the French more than anything else. Ideas of such things were absorbed by the rank and file of the army. Potential ideas were retained by artisans who were among their number, and actual specimens of carving and painting were taken home by their officers. The king himself not only acquired ideas and choice works of art but included in his returning retinue many artists and artisans, notably painters and gardeners.

There was also a noticeable effect on the Italians themselves. In spite of the general unfriendliness engendered among them by the attitude and conduct of their royal visitor and his followers, they were measurably impressed with the wealth and affluence of a king and a country which could produce such an organization as the French army. They sensed new markets for their genius and talents. Here begin the interesting chronicles of the pilgrimages of many Italian artists and art workers to the valleys of the Seine and the Loire. Numbered among these were no less distinguished personages than the self-lauded Benvenuto Cellini, silversmith of Florence, G. Barozzi da Vignola, architect, of Rome, and Leonardo da Vinci, who forsook his native Milan to spend the last years of his life at Amboise.

The immediate subsequent effect of this general movement was felt in the valley of the Loire, where were the country places and hunting preserves of the royalty and other politically affluent per-

sons. It is just here that the rhetorical link is furnished which joins our two ideas: that of the army of Charles VIII. going to Italy and of the American army going to France. For it is a fairly well established fact now that a goodly number of concentration camps, training camps, rest camps and replacement division camps of the American Expeditionary Forces are comfortably and conveniently located in the Loire valley. That portion of France which had been made a veritable desert by the constant wars and internal feuds of the first half of the fifteenth century has fortunately been spared the experiences of devastation in the present conflict and has always been far enough from the actual battle lines to be devoted to camp purposes.

Let us consider briefly, now, what our soldiers are seeing abroad. Before reaching the Loire valley they will see masonry structures on every hand. It is remarkable how persistent are the references to this fact in letters which the soldiers are sending home. The cities and towns and villages are all of masonry; the churches, the stores, the government buildings, the small houses, the farm cottages, the barns, places where the men are billeted, sturdy and substantial structures of stone are making indelible impressions on their minds. As for the large structures which they see in the Loire valley, a discussion of these would practically embrace a résumé of the early Renaissance architecture of France. For it was in these parts that that prolific builder Francis I. (1515-1547) erected his seats at Blois and Chambord, the latter one of the largest private country establishments ever built, and made extensive additions and alterations to many of the smaller royal seats in the neighborhood. He encouraged and even demanded of his courtiers that they emulate his building propensities, and our soldiers will see at Chenonceaux and Azay-le-Rideau two magnificent examples of smaller rural seats. In this and in neighboring valleys they will see, too, such interesting and historic châteaux as those at Cheverney, Valençay, Ussé, Amboise and Chaumont, Luynes, Langeais, and even Chateaudun.

In the towns, as at Blois, Tours and Orleans, these courtiers of Francis I. erected residences or *hôtels* to accommodate their households during periods, when the court was in residence in the neighboring châteaux.

The municipal authorities of that time were not slow to follow the example set, and there are town halls at Beaugency, Loches, Saumur, etc., of the period. So the architectural fascination of the Loire valley and of the valleys of the neighboring streams lies not merely in their royal castles but also in the smaller establishments which dot the country side, and in the towns. But all the buildings of the period, from castle to cottage, are "delightful in proportion, refined in detail and designed with ease, apparently hardly designed at all, as though everything came natural in that valley known as the 'Garden of France,'" from Angers to Orleans.

So in training or at rest our brothers and cousins and friends will be seeing these things. Most of them will see Paris, too, perhaps only casually in most instances, and they will be impressed with the delightful openness of the city plan and will appreciate what is the basis of Parisian civic pride. At its museums and at its historic spots their vision will be expanded and their horizon enlarged. They will be unconsciously influenced by the universal symmetry and the apparent fitness of structural endeavor and esthetic law and order. They will be impressed and unconsciously influenced by feelings of solidity and permanence and general good taste in building and not least of all by largeness of scale.

What has been briefly pointed out here with respect to the heart of France applies in a smaller measure to other places. Other parts of France and other styles than that of the châteaux will influence our soldiers, as the towering churches of an earlier period and the later cosmopolitan structures. In England a small fortunate proportion may have time enough to get an insight into

some of the joys and delights of English domestic architecture. In Italy, too, some will be happily initiated into the earth's select who know the skies and trees and villas and mountains as does Maxfield Parrish. It is to be hoped that the sojourn of our forces in German territory will be so brief as not to obliterate previous impressions nor to suffer them to be even unconsciously influenced by contact with some of the salient historic and modern examples of the architecture of Kultur.

When this fiftieth part of our population returns to these shores they are going to be greater lovers of our republic, they will return as citizens of the world and better citizens of their own country; but in many ways they are going to seek and to demand better and greater things. They will leaven the whole American aggregate and a great deal more effectually than has been possible by the fortunate few who have heretofore been educated by foreign travel.

Architects are going to find their clients demanding certain things which heretofore have meant nothing to them. They will be demanding work which has a certain spirit of historic significance.

Architects will have less of a struggle to attain ideals with which they have been inspired and it will not be such a hopeless task to lead the thoughts of the average layman along artistic as well as practical lines.

Architects will not be ridiculed when they discriminately suggest ideals in architecture which have a distinct basis in sound continental ideas.

The sojourn of our soldiers in the Loire valley may not result in the institution of a style or a period which the textbooks of architectural history will catalogue as the "château revival," although worse could happen. It is going to be more far-reaching in its effects. It is going to give impetus and inspiration to the artistic temperament of the people, and the good architect must and will keep a few paces ahead of it.



FIG. 1. MOSHOLU PARKWAY STATION, JEROME AVENUE LINE.

ARCHITECTURAL TREATMENT OF STATIONS ON THE DUAL SYSTEM OF RAPID TRANSIT IN NEW YORK CITY



By S. J. Vickers

THE new subway system for the City of New York, which is now being completed by the Public Service Commission for the First District, is known as the Dual System of Rapid Transit. It ties in with the original subway lines, uniting all of the boroughs, save Richmond, by utilizing all four of the great bridges, one tunnel under the Harlem, and six tunnels under the East River. This grand system consists of about six hundred miles of single track; has a capacity of 3,000,000,000 passengers per annum and will cost \$350,000,000. It is by far the most extensive city railroad system in the world.

The object of this article is, however, not to describe the magnitude of the system, its varied and difficult engineering

problems, nor its many practical questions incidental to operation, but rather to deal with the problem of the decoration or finish of the subway stations and to present certain elevated structures which have received special treatment.

THE SUBWAY STRUCTURE.

In the so-called side platform subway station the entrances run directly down to the wing of the platform which contains the control. All of the deeper stations are supplied with mezzanines. Certain stations have mezzanines at either end, and several of the important express stations have continuous mezzanines with a series of stairways running down to the platforms. It is the decoration of these mezzanines and of the side



FIG. 2. TILE AND MOSAIC BAND—HUNTS POINT ROAD STATION, WESTCHESTER AVENUE LINE.

walls at the platform level with which we are concerned.

In the matter of decoration we were confronted with the problem of finishing the rough wall surface with materials which would be appropriate, durable, sanitary and easily cleaned. We wished the station to have an air of simplicity which would give an impression of light and cheerfulness to the city's millions of daily passengers.

Many of the stations are irregular by reason of the structures which they support. A huge column rises from the platform to support an equally huge girder in the ceiling; a depressed bay is necessary to give room for a water main above; a break is necessary in the side wall to accommodate the house sewer. Massive walls of concrete and steel on every side give evidence of great strength and utility. We felt that any attempt to hide the structure or conceal its strength would be wrong; we also felt that the decoration must have an element of severeness and restraint. Consequently no attempt was made to decorate the ceilings, which are plastered with cement mortar directly to the concrete.

Hollow tile is fitted in the arches of the side walls between the columns forming the backing for the wall decorations, which consist of a low cement base and a

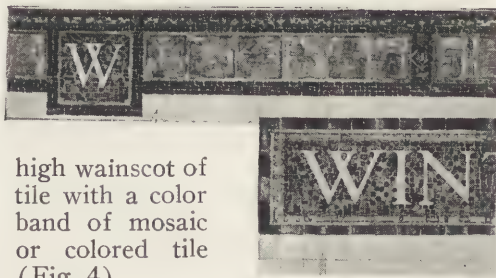


FIG. 3.

high wainscot of tile with a color band of mosaic or colored tile (Fig. 4).

In the tile field is inserted at intervals the station name tablets at a height to be easily read from the train. A white glazed tile with porous back of different units, 3 by 6 inches, 4¼ by 4¼ inches and 6 by 6 inches, has been used in general to make up the field of the wainscot. In certain stations a combination of alternate courses of 3 by 6 inches and 6 by 6 inches was used with pleasing effect.

Walls composed of the larger units are much more effective than those on which the ordinary 3 by 6 inch tile is used. However, 6 by 6 inch tile is the practical limit, as units of greater size are expensive and often difficult to obtain.

At the entrances, where the walls are exposed to the weather, a hand made weatherproof tile is used. This tile has a hard burned, semi-vitreous body and is laid with a generous joint.



FIG. 4. VIEW OF TYPICAL SUBWAY STATION, SHOWING FINISH OF WALL AT PLATFORM LEVEL.

The band forming the upper member of the wainscot is designed to give a note of color and brightness to the grim structure of concrete and steel. It is composed of mosaic or a combination of mosaic and colored tile, with plaques opposite the platform columns (about fifteen feet on centers) containing the initial letter or street number of the stations to assist the passenger in the approaching train to determine the station name (Figs. 2 and 3).

In several of the stations historic plaques are used in the bands instead of initial letters. The Canal Street plaque (Fig. 4) shows the old stone bridge with an arch spanning the creek which in other days wended its way westward to the Hudson.

The new Borough Hall Station (Fig. 4) has a band of hand-made colored tile with a mosaic field. Its plaque represents the tower of Brooklyn's Borough Hall.

The station name tablets are spaced about forty-five feet apart in the tile field, just below the band, with a dark mosaic background and colored tile border that they may easily be seen by passengers on the trains.

The side walls of express stations facing the platforms have columns spaced 5 feet on centers between which the tile is fitted (Fig. 2). A band of color runs around the white, forming a series of panels tied together with the continuous upper band, all of which is kept flush with the steel.



FIG. 5. COLORED TILE BAND WITH MOSAIC FIELD.

For the sake of sanitation, appearance, and economy in maintenance, surfaces so far as possible are kept plain.

Paneling, string courses, moldings and dust catching ledges are avoided. Intersections of walls are fitted with "bull-noses" or re-entrant angles with special pieces at corners of openings. Grilles and railings are of plain square bars; doors are of steel and without panels; ticket booths and newsstands are of steel or masonry. In short, the entire design of the station is severe, and the materials are so handled that they may be in keeping with the structure which they furnish or decorate.

ELEVATED STATIONS.

The construction of an elevated line is cheap and easy in comparison with the difficult subway work.

Because of the cost of special steel work we have not been able to design anything in steel but straightforward utilitarian structures composed of standard shapes.



FIG. 6. FORT HAMILTON PARKWAY STATION, NEW UTRECHT AVENUE LINE, BROOKLYN.



FIG. 7. QUEENS BOULEVARD STRUCTURE, WITH RAWSON STREET STATION IN FOREGROUND.

Paris and Berlin have elaborate elevated steel structures, but in those cities the difference of cost between standard and special shapes is much less than in this country, where the scale of wages is high. We have, however, made an effort to use the standard shape to the best advantage. At the station a decided improvement has been made by substituting the mezzanine for the ticket house at the platform level. The result is that the station is a long, low, orderly structure which is not displeasing.

It is, however, the policy of the Commission to supply special structures at the crossing of boulevards or parkways or at the intersection of important streets forming points of interest or civic centers. It is with these structure that we are now concerned.

The problem at Mosholu Parkway was to erect a station (Fig. 1) over the concrete bridge which spans the boulevard connect-

ing Van Cortlandt and Bronx Parks. It is a steel frame covered with concrete, with enclosures at either end of the bridge which contain stairways leading up to the mezzanines, where the controls are located. Windscreens are provided, continuous with the platforms. There are tile inserts in the concrete of the stair enclosures and in the pylons of the windscreens.

Fort Hamilton Parkway station in Brooklyn (Fig. 6) crosses the avenue for which it was named. Here the wind-screen overhangs the column and girder line. The soffit of the overhang is composed of continuous panels of tile. There is a frieze of inlaid colored tile on the face of the girder with plaques at the columns.

QUEENS BOULEVARD STRUCTURE.

The most unusual piece of construction with which we have been concerned



FIG. 8. QUEENS BOULEVARD STRUCTURE, BETWEEN STATIONS, SHOWING INLAID COLORED TILE.

is that erected for a distance of four-fifths of a mile in the broad avenue known as Queens Boulevard in the Borough of Queens (Figs. 7 and 8).

When the avenue is complete there will be a drive and a strip of parkway on either side of the structure, with the trolleys underneath. This structure has large reinforced 65-foot longitudinal and 35-foot cross arches.

The form of the vault supported by the arches is a dome. A continuous band of tile on either side with large plaques at the columns give the huge structure a touch of grateful color.

SURFACE TREATMENT OF CONCRETE.

On all of these stations the concrete dressing was done with pneumatic tools. The four-pointed tool was used. Bands varying from two inches to four inches were usually left around panels and corners which were

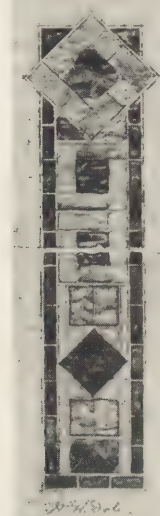


FIG. 9.

rubbed smooth, giving a frame or setting to the regular work. On certain work with big surfaces, a wider band was left, and this was hand-tooled with lines at right angles to the corners, about three-fourths of an inch apart. These are practical ways of finishing corners or arrises, as it is impossible to dress them with a pneumatic tool without chipping and forming more or less irregular lines.

The contractors were required to dress away any unevenness caused by the bulging of the forms, bringing the surface to even planes in which all the cement skin was removed and the gravel lying near the surfaces chipped or cracked to give a sparkling effect. By the removal of a considerable portion of the surface most of the board marks disappeared. It is a curious fact, however, that a few board marks will remain although the entire surface is dressed to a plane; this

is probably caused by the fine sediment collecting about the joints of the boards.

DESIGNING IN CONCRETE.

Some one has said of the painter that his one compelling purpose is in all fidelity and singleness of aim to translate the impression received. To produce a successful structure in concrete the designer should perhaps have a vision of bigness and simplicity. He should strive to disremember his schooling, "which doth make cowards of us all," to cleanse his mind of such architectural forms as cornices, string courses, dentils, modillions, keystones and voussoirs, and to draw on those more valuable acquisitions which enrich the mind after years of work and study—a sense of fitness and proportion, a sympathy for broad surfaces and an apprehension of simplicity; then will he arrive, if he be able to add to this quality something of the pith and vigor with which the Master Dramatist clothed Macbeth, who, defying his opponent, the sinister threat of Birnam Wood and that unusual and unorthodox handicap of being born of no woman, stood stanch and bid the stout McDuff "lay on!"

We may not applaud the character of this ambitious canny Scot as do we that of the noble Caesar, who preferred men about him that were fat; or the gentle Cordelia, whose voice was ever soft, gentle and low, an excellent thing in woman. These characters though differing widely endure through the ages simply because of the manner of presentation. Just so the material, be it rough or rich or fine, in the hand of the artist becomes a thing of beauty. The rough stone wall, the lofty gilded marble hall, the painting in milady's boudoir are ugly or commonplace or things of beauty, depending upon the presentation.

The designer in concrete should there-



FIG. 10.

fore omit forms which in that material become meaningless, striving rather for large surfaces, enriched, unbroken, and hence unspoiled.

INLAID COLORED TILE AS A DECORATION.

Colored tile, it would seem, is a most appropriate enrichment for a concrete surface (Figs. 9 and 10).

Back in the dim past the children of the Nile not only enriched the entire bulky column and capitol but covered large areas of wall surface of the stately impressive halls and temples of their kings and gods.

Something of this was in some way handed down to the artistic Greek, who enriched the entablature, the pediment and the capitol of his column with brilliant color.

The Moor covered the wall surfaces of his mosque and slender soaring minaret with colorful geometric patterns and interlacing bars, giving much of the rich effect indeed by the use of colored tile.

Since the days of the Renaissance, however, architecture has depended upon form rather than upon color for exterior enrichment. Effects have been gained by the arrangement of architectural motives enriched by carving and sculpture without the aid of color.

Now the use of these forms in a plastic material such as concrete is not practical or appropriate. It is much better to design simply, omitting "not the sweet benefits of time" but much of the detail characteristic of stone work. If a little color be needed, enrich the rough and rigid surface with bands or plaques of tile. It may be had in any color or formed in shapes or patterns to suit the most fastidious designer's fancy. It may be used with restraint to soften a façade even as a piece of tapestry tempers a wall of stone, or if it be desired to emphasize any feature a plaque of joyous

brilliant color may be placed which will shine resplendent like a rich jewel roughly set.

COLOR IN ARCHITECTURE.

In a recent article appearing in the *Record* the writer predicts a golden age in which color will again come into architecture because life will be joyous and joy demands warmth and brightness and color.

If this be realized it seems safe to predict that the colorful products of baked clay will be employed to add grace and charm and beauty to the arch, the vault and the lunette of the interior and to our gray and overburdened exteriors, which will take on light; and there will be color in our domes and heaven pointing spires.

Perchance in this golden age the predicted new style of architecture representing clarified American ideals shall have been realized.

The crowning glory of the Acropolis; the pomp and splendor of the Eternal City; the intricate and colorful surface decorations bequeathed by the Moors; the rich and soaring vaults and spires of the master-builders of medieval days; the revival of classic forms, giving expression to the noble palaces of the Renaissance! Shall all of these be thrust into the witch's caldron there to boil and bubble until the "yeasty waves confound and swallow navigation up"?

What shall be brought forth we know not. It will be unlike any of these, for each represents the separate, inherent aspirations of its creator, hence the infinite variety. Yet may it be tempered by the past "like the calm rose of a lute." May it be filled with wonder, joy and fancy. May it be conceived in strength and power, standing forth like a prophet of old proclaiming calmly from a lofty height great and universal truths.



THE OLD PALMER HOMESTEAD.

The UNITED STATES HOUSING CORPORATION

Project No. 59 at Bath, Maine

AT the time the shipbuilding activities of the Government began to assume tangible form, the growing need of houses for the ship workers at Bath, Maine, caused the United States Housing Corporation to take active steps to relieve the situation. When it was found that the problem could be solved in no other way than by the construction of houses, the work was entrusted to Parker, Thomas & Rice, architects; Loring Underwood, town planner; and Weston & Sampson, engineers; all of Boston.

The site selected is a tract of approximately twenty-four acres, commonly known as the "Palmer Farm." Only half of the area is being developed at this time, but as needs arise new streets can be built without interfering with the

present arrangement. In the meantime the undeveloped part will serve as a natural park and playground.

One of the attractive features of the development is the use made of the old Palmer house. The architects have very wisely used this well preserved and very interesting old homestead as a source of inspiration for the style of the smaller houses that have been planned to be grouped about it as a new community. Facing the old house there is to be a small rectangular green to be known as "Flaherty Park," in honor of the first Bath boy to lose his life in the war. From the park new streets communicate with existing thoroughfares that lead to the ship works.

The size of the house lots will vary from forty by eighty feet to forty-seven



VIEW LOOKING TOWARD OLD PALMER HOMESTEAD AND SHOWING FLAHERTY PARK,
NAMED AFTER FIRST BATH BOY TO LOSE HIS LIFE IN THE WAR.



VIEW DOWN ANDREWS ROAD.

Varied exteriors obtained by the use of four types
of floor plans.—U. S. Housing Corporation Project
No. 59, at Bath, Maine.



FIRST FLOOR PLAN
TYPE 'A' HOUSE.



SECOND FLOOR PLAN
TYPE 'A' HOUSE.



FIRST FLOOR PLAN
TYPE 'B' HOUSE.



SECOND FLOOR PLAN
TYPE 'B' HOUSE.



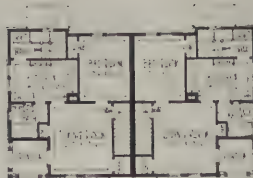
FIRST FLOOR PLAN
TYPE 'C' HOUSE.



SECOND FLOOR PLAN
TYPE 'C' HOUSE.



FIRST FLOOR PLAN
TYPE 'D' HOUSE.



SECOND FLOOR PLAN
TYPE 'D' HOUSE.

THE FOUR TYPES
OF FLOOR PLANS.

by one hundred feet, and the houses are so arranged that no two will be closer than sixteen feet from side to side. From rear to rear there will be approximately sixty feet, thus allowing generous space for gardens.

As befits the traditions of Bath, the houses are to be of wood. Although only four types of plans are used, a skillful arrangement of porches and minor details will prevent monotony and will produce a harmonious and distinctly American appearance. All of the houses will be two stories high, simple in plan and design. Roof surfaces are unbroken. The houses will be clapboarded and painted and roofed with asphalt shingles. The inside finish will be of North Carolina pine, painted. All floors will be double and the top flooring will be of oak. All houses will have cellars under their entire area. Each single house will have a living room, a dining room and a small kitchen in the first story and two or three bedrooms with closets, bath room and linen closet in the second story. There will be a brick fireplace in

the living room of some of the houses. The stairs to the second floor lead generally from a small hall provided with a coat closet. All principal rooms have windows on two sides, except in type D (four-family houses.) Each kitchen will be equipped with a coal-burning range, gas heater, sink and wash trays. The heating will be done by hot-air furnaces. Electric wiring and light fixtures are also furnished.

The result promises to be a well ordered and charming New England village of attractive houses. The construction throughout is of a substantial character that undoubtedly will cause the houses to be sought by private investors at such time as the Government may decide to transfer its interests. With the armistice in operation and a victorious peace in sight, the housing situation at Bath is in no way changed from its wartime urgency, due to the fact that additions to our merchant marine are required for the commerce of the reconstruction and of the peaceful times that are to follow.



ENTRANCE—CHICAGO INTERIOR PERMANENT STORAGE WAREHOUSES. S. SCOTT JOY, ARCHITECT. GEORGE C. NIMMONS & COMPANY, SUPERVISING ARCHITECTS FOR UNITED STATES GOVERNMENT.

MODERN INDUSTRIAL PLANTS



By George C. Nimmons

PART III.—PLANS AND DESIGNS.

AMONG the essential requirements for the successful operation of any industrial plant are the plans and designs for the buildings. Assuming that a proper site (with the needed transportation, room for expansion, accessibility for employes and materials, and the other requirements described in Part II of this series) has been obtained, the next step in the establishment of the plant is the making of the plans and designs for the buildings.

Mistakes in the management or operation of a plant can usually be corrected without material disturbance to the business; but mistakes in the plan, arrangement or design of the buildings require, as a rule, a "major operation," in order to put the plant in a healthy, growing and efficient state of development. The plan and design of the buildings fix to a certain extent the character of the future business, just as certainly as the mould determines the casting when the metal is poured. The plan and design for each building should therefore be made perfect before beginning its construction. The work shop, or the plant, is the master tool, as is well said in the A. W. Shaw Company's "Factory Management" series.

In nearly every manufacturing industry the making of the product involves several distinct processes, which should be separated from each other into different rooms, departments or buildings. The raw material may be a single substance or it may consist of a number of substances that require various kinds of preparation before they can be incorporated into the make-up of the product. In fact, the complete operation of a single plant may be so complicated that its various processes of manufacture ex-

tend out from the main flow of production like the tributaries of a great river. However, the flow of production must not be allowed to wind or to bend from its direct course, and there must be no obstacles to retard its progress.

The parts of the building, therefore, should be so arranged that, in the manufacture of the product, the raw material is made to travel logically and directly through the plant from one process to another, without lost motion, needless handling or delay, till it reaches its finished state ready for the market. Whether the material travels in this direct course depends often entirely on whether the rooms or departments of the plant have been arranged so as to make direct travel possible.

Imperative and essential as this requirement is, it is surprising how many plants there are in which the production flow is interrupted by the arrangement of the building. Not infrequently the material is passed up and down several times from one story of a building to another before the product is completed; in one extreme instance the material passed up and down four times from the first to the fourth floor, although, if the building had been properly arranged, the material would have traveled only once from the fourth to the first floor.

Where a plant consists of several buildings the arrangement of the different buildings and the utilization of the spaces between them are just as important in controlling the flow of production as are the different parts of a single building.

When the flow of production is unnecessarily interrupted it makes a gap in the manufacturing process. As a result of such gaps materials accumulate there,

occupy valuable floor space, cause delay in their completion, increase the danger of breakage, and may require a considerably larger force of operatives in some departments than would otherwise be necessary. Interruptions of this nature readily add five or ten per cent., or even more, to the cost of production; and the increased cost is the more regrettable as the wasted money does no one any good.

It is a curious fact that much more ingenuity has been exercised in the planning of machinery to reduce waste than has been exercised in the planning of buildings to accomplish the same end. When the great advantage of well planned and properly designed buildings is so vital to success, why is it that so many buildings should exist which, by their plan and arrangement, hinder the direct flow of production, do not lend themselves to the best quality of workmanship or in other ways handicap the business? The answer is that probably a majority of industrial buildings are planned and designed by the owners themselves or by some operating superintendent of the plant. This is usually done on the theory that each owner or his head operating man knows the business best and that from this direct knowledge the best plan and design for the building are bound to follow. However, unless the owner or the operating superintendent is a skilled designer of buildings, he cannot possibly make the best plan and design. He is apt to stop his study of the problem at the completion of the first sketch, thinking that, since he knows his own requirements so well, his first sketch must of necessity be the logical solution of his problem. The first sketch is hardly ever the best solution of a problem, and, besides, it does not follow at all that in the hands of an unskilled planner of buildings the best plan will evolve itself out of a thorough knowledge of requirements. The sketch of a manufacturer not experienced in the planning of buildings, whether it be his first sketch or the latest of many, is usually child's play compared to one by a skilled designer. The ability to plan and design buildings comes not alone from inherited aptitude nor from a mechanical or engineering knowledge of industrial

processes, but mostly from a special development of mental faculties which enables the trained designer to visualize a variety of ways of solving a problem, to use one or many of innumerable resources familiar to his experience for overcoming obstacles, to investigate untried groupings and arrangements of buildings, to create, like the inventor, some special layout or design of construction that will eliminate former waste of production and assist in the reduction of manufacturing cost.

In its larger features a building plan often appears simple and easy to make. That is the chief reason, no doubt, why many people imagine they are pretty good architects even though they have no training or experience. Possibly the requirements of a plant involve only a few manufacturing departments, a storage space, receiving and shipping facilities; yet the wrong placing or spacing of elevators, stairways, working areas, receiving and shipping departments, or the failure to secure proper light at critical points, sufficient carrying capacity or stiffness of construction, may handicap the plant as long as it exists. The most usual omission in the work of an amateur planner, however, is failure both to conceive the possibilities of his building site and to provide for improved manufacturing methods. The chances are overwhelmingly against an inexperienced planner of buildings in his effort to make a building that will be a "master tool."

In preparing to build a new plant, the first thing for the owner to do is to decide upon the approximate locality in which to build, to make a general program defining the nature and extent of the improvements contemplated, and then to select an architect before the building site is decided upon, so as to make sure under his guidance that the site to be chosen has all the essentials and advantages required for the particular needs of the proposed building improvements. An owner should never hesitate to bring the architect into touch with a building enterprise at its very inception. No matter if the whole project is abandoned before any plans are made, there is no harm done, as the professional charges for the architect's services up to that



CHICAGO INTERIOR PERMANENT STORAGE WAREHOUSES AND COLD STORAGE PLANT.

Erected for

THE UNITED STATES GOVERNMENT

in the Central Manufacturing District of Chicago,

H. E. Poronto, District Manager.

In charge of

Major S. L. Nelson, Constructing Quartermaster.

S. Scott Joy, Architect for the entire project.

George C. Nimmons & Co.,

Supervising Architects for the Permanent Warehouses for the Government.

Gardner & Lindberg,

Supervising Engineers for the New Cold Storage Building for the Government.

The Quartermaster Headquarters of this district, in charge of Brigadier General A. D. Kniskern, are in the top of the two large warehouse buildings at the left which, together with the one-story temporary warehouses, were erected after war was declared by the United States. The power plant, in the center, with the tower, the warehouse back of that and the first cold storage building to the right, were already built when the war began, and are rented by the Government. The remaining large cold storage building on the right is in process of construction. Food, clothing and supplies for soldiers are collected, stored and shipped from this plant.



CHICAGO INTERIOR PERMANENT STORAGE WAREHOUSES OF THE UNITED STATES GOVERNMENT, BUILT BY THE CENTRAL MANUFACTURING DISTRICT OF CHICAGO.

These buildings are at the left of the general view above. Together they are 600 feet long by 324 feet deep. Reinforced concrete construction. Total area of floors 1,260,000 square feet. Construction started March 1. Occupation of part of the basement with Quartermaster supplies June 12. July 20 three elevators in operation and various spaces throughout the building available for storage. By August 15 almost the entire storage part of the building was ready for occupancy.



FREIGHT STATION AND LOFT ERECTED FOR MONTGOMERY WARD & CO. BY THE CENTRAL MANUFACTURING DISTRICT.

S. Scott Joy, Architect.

This building was taken over by the Government and is the large building shown behind the Power Station in the general view of the Government Buildings.

time would be relatively small. If an owner buys a property without the advice of the man who understands the requirements of the building that is to occupy it, he may make a mistake that would be far more serious than the small architect's fee involved.

The best way to select an architect is to employ one whose ability, experience and personal attainments seem best fitted for the work in hand. There is no material difference in the fees of capable architects. An owner who has been advised to select an architect by holding a competition among a number of architects has been poorly advised. The American Institute of Architects has had a standing committee on competitions for over forty years; on the strength of its accumulated records, this committee advises against architectural competitions because it has found that as a rule they neither procure the best man for the job nor the best plan and design for the building.

After selecting his architect the owner should give him a list or diagram of all the requirements of his business and allow the architect and his men free access to the old plant so as to become perfectly

familiar with its operation, its defects as well as its good points. In addition, if the owner has any pet schemes for improvement which he has been saving up for the new building, now is the time to give them to the architect.

A study of the problem in all its aspects will then be made by the architect, who will consider not only present needs but provisions for reasonable growth and development in the future. After the architect has thoroughly digested the project he will submit sketches showing a comprehensive layout of the immediately proposed and future plant. There will likely be many sketches, as layout sketches are readily made by an architect; there will probably be one representing every possible way that the plant can be laid out on the property in question.

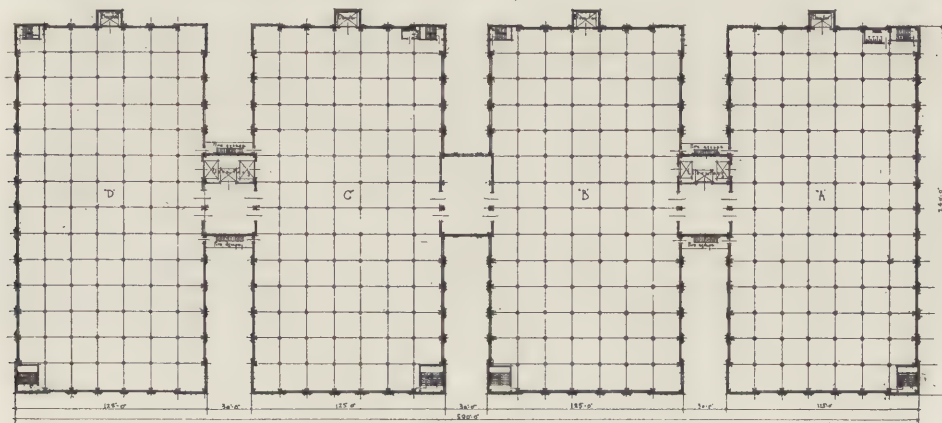
By making a sketch to represent each of the different ways in which the plant might be built to accommodate the business, it is possible to compare the various ways of providing for the operation of the plant, to criticise intelligently the good and the bad points of each scheme, to select the desirable features from this plan and that, and to build up a final

plan for approval that will represent the best results of the architect's skill and experience in planning and arranging and the owner's knowledge of the requirements of his own business.

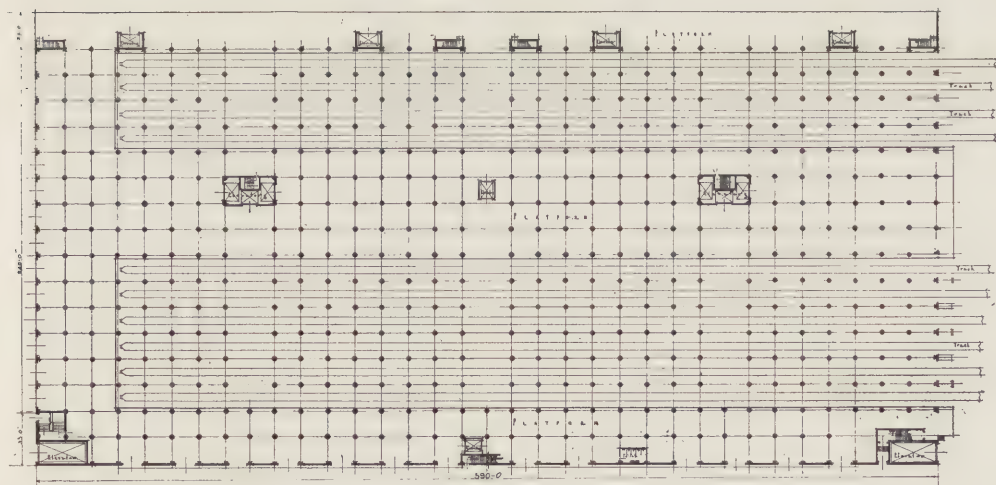
After this the complete working drawing and specifications will be made by the architect, bids taken from contractors, or a contractor selected directly, and the contract or contracts let. One big relief from anxiety to an owner, if the work is in the hands of a competent architect, is

that the drawings and specifications will be complete. All the study which the architect has put on the preliminary sketches and on the requirements of the owner results not only in securing the best plan and arrangement for the buildings, but also enables him to put in the original contract everything needed, thereby avoiding changes and expensive "extras" after the work is started.

When the contract is let, the architect and his men supervise the work of con-



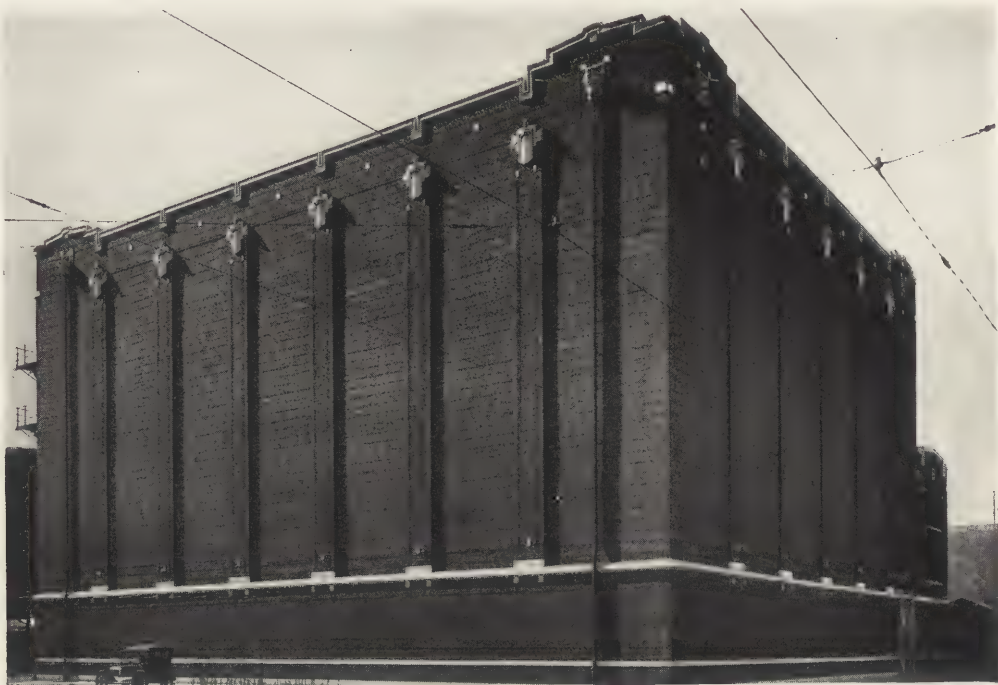
TYPICAL FLOOR PLAN
SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

FREIGHT STATION AND LOFT ERECTED FOR MONTGOMERY WARD & CO. BY THE CENTRAL MANUFACTURING DISTRICT.

S. Scott Joy, Architect.



COLD STORAGE PLANT BUILT BY THE CENTRAL MANUFACTURING DISTRICT FOR THE
WHITE CITY COLD STORAGE COMPANY.

S. Scott Joy, Architect.

This building was taken over by the Government and is the first to the right in the general view of the Government Buildings.

struction, issue vouchers and certificates for payment and turn the building over to the owner at its completion.

In connection with the making of the first sketches of the plant, there is a convenient way of showing just how materials and goods are to be handled in the different processes of manufacture. This is called "routing" and is expressed on drawings by lines and arrows, sometimes in several colors, which indicate the way the materials and goods travel or are moved in their manufacture. It is sometimes helpful to make a perspective of the whole plant with the walls removed, thereby exposing the different stories, where dotted lines or other graphic signs show how materials and goods are moved in the flow of production.

DISCUSSION OF THE CHARACTER AND COST OF THE DIFFERENT KINDS OF CONSTRUCTION.

The selection of the most suitable type

of construction involves the consideration of the various kinds of modern building construction.

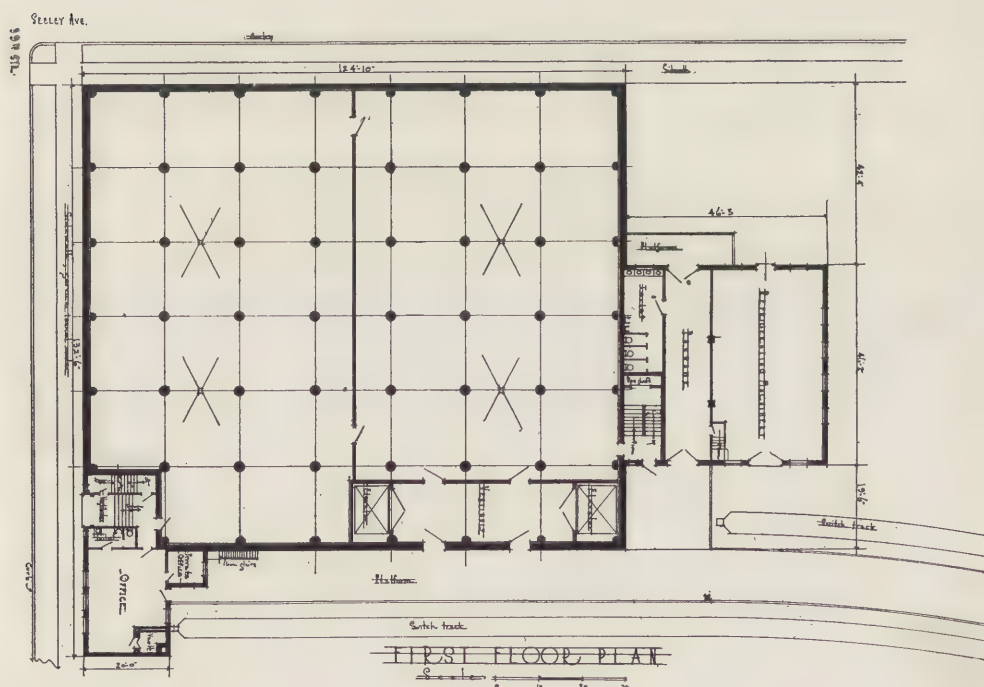
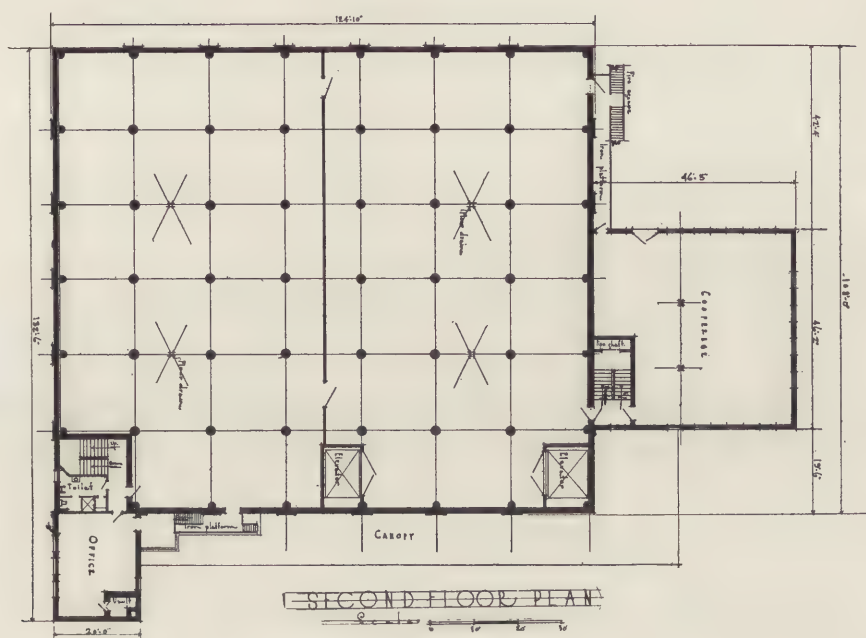
The distinguishing features of the different kinds now in use are as follows:

Frame Construction: Outside walls, floors, posts and roof of wood.

Ordinary Construction: Outside walls of masonry; floors, posts and roof of wood of thin dimensions, less than those required by insurance companies for mill construction.

Mill Construction: Outside walls of masonry; floors of wood at least three and a half inches thick, roof two and a half inches thick, posts wood at least ten by ten inches or of metal fireproofed, and all floor joists or girders at least seventy-two square inches in area or of metal fireproofed.

Slow Burning Construction: Usually of wood similar to mill construction, but with the underside of floor joists and girders protected by metal lath and plaster and an inch and a half of mortar or



COLD STORAGE PLANT BUILT BY THE CENTRAL
MANUFACTURING DISTRICT FOR THE WHITE CITY
STORAGE COMPANY. S. SCOTT JOY, ARCHITECT.



MIDLAND WAREHOUSE, CHICAGO.
S. Scott Joy, Architect.

incombustible material above the rough floor.

Reinforced Concrete: The vertical supports, floors and roof of concrete reinforced with steel; outside walls usually of brick or concrete or a combination of both.

Steel Skeleton Fireproof: The vertical supports, the joists and girders of structural steel shapes, with the floor spaces between filled with hollow fireproofing tile or other similar material and the outside walls closed in with masonry supported by steel skeleton.

In addition to these main distinguishing features there are special requirements for each type concerning fire walls, stairway and elevator enclosures and various other details.

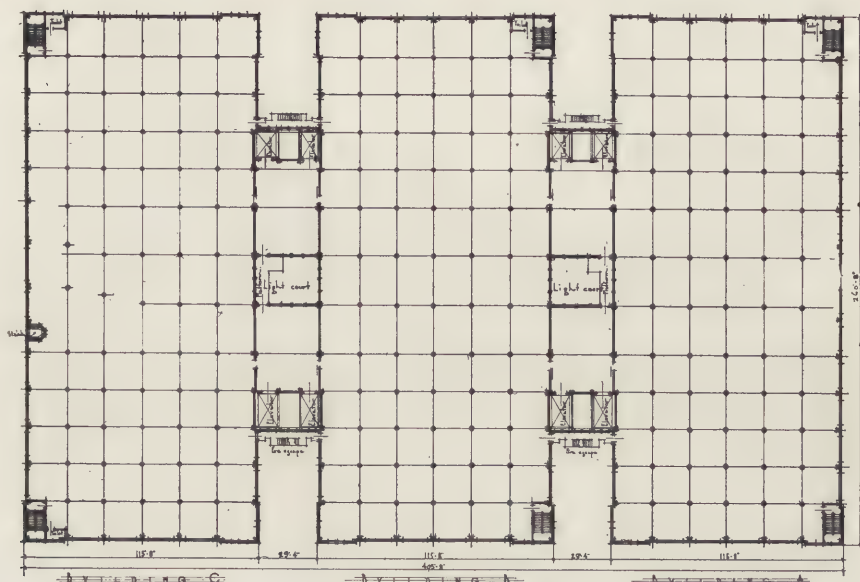
There are also mixed types of construction not defined in the above classification which should be mentioned, such as large steel skeleton shops and foundries that are sometimes enclosed only with sheet metal, and extensive one-story saw-tooth skylight buildings that may possibly have tile walls and steel or timber roof trusses.

In selecting the type of construction for a great majority of industrial plants, the choice would usually fall among the types of mill construction, reinforced concrete and steel skeleton fireproof, or

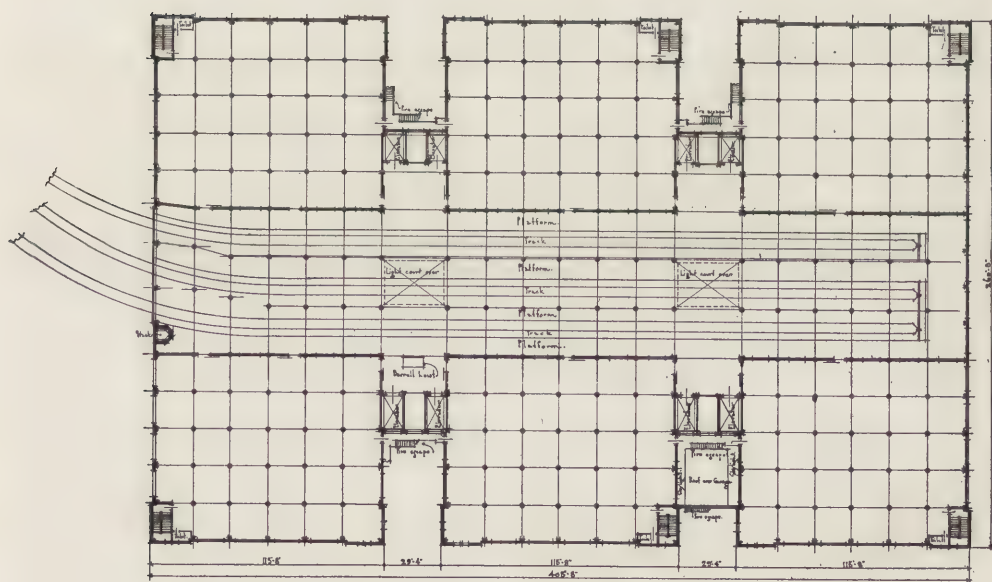
in some cases a combination of two of these.

No one, if it is possible to avoid it, should build an industrial plant of frame or ordinary construction, because of its temporary nature and the high cost of fire insurance.

Mill construction is a form of heavy timber and plant construction that was at first most extensively used by textile mills of this country. It has been adopted by all sorts of industries and often increased in height up to seven or eight stories, which in recent years has been fixed by most city building departments as the limit of height beyond which such buildings must not be built. This kind of construction is entirely practical and serviceable, but lacks the feature of stiffness at the joints between one story and another which the more modern systems of concrete and steel skeleton construction so well provide. In mill buildings, rigidity or resistance to moving or leaning over sideways must be secured entirely by the bulk or weight of the outside piers and walls, because the columns have loose joints at every floor and the girders and beams rest on piers and walls, with no anchorage or bracing that would materially resist the pushing of such a building over sideways. The old idea was that all timbers should only be



TYPICAL FLOOR PLAN



SECOND FLOOR PLAN

MIDLAND WAREHOUSE, CHICAGO.
S. SCOTT JOY, ARCHITECT.



CHICAGO JUNCTION TERMINAL BUILDING.

S. Scott Joy, Architect.

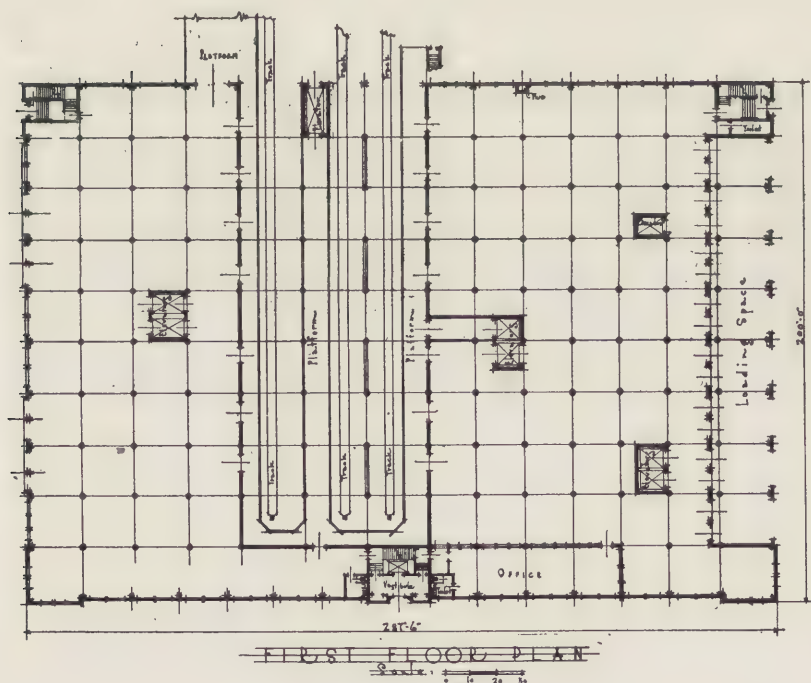
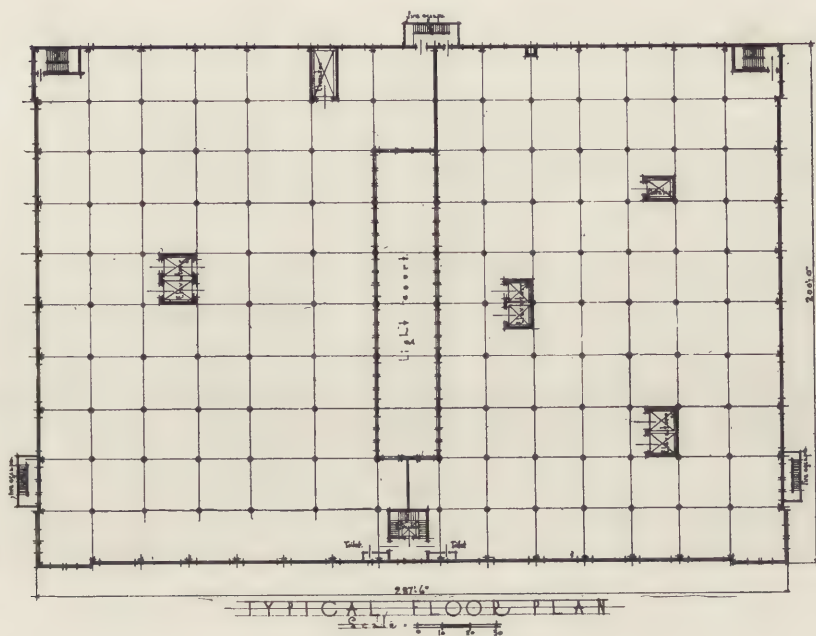
so anchored in the walls that they could fall out readily in a fire without pulling the walls down. This method of construction prevents bracing against lateral movement. The three kinds of mill construction usually employed are:

First, the construction consisting of girders and joists to support the plank floors where the joists are placed entirely on top of the girders, thus making large open spaces above the girders throughout the ceiling of each story.

Second, the same construction where the top of the joists are placed flush or level with the top of the girder and supported by iron stirrups or brackets attached to the girders. This method avoids the great dust catching spaces above the girder, saves all the head room of the depth of the joist in every story and reduces the cost of the building by eliminating usually fourteen or sixteen inches of height in all walls, columns and partitions of every story. An objection to it was once raised by the insurance authorities on account of the unprotected metal supports of the joists. Experience, however, has since proved that the liability to failure of these metal supports in a fire is remote; and while there is a

penalty still imposed in the insurance, it is so slight as not to be material when compared to the advantages to be gained.

Third, the construction where the joists are omitted and the floors made thick enough to span directly across from one girder to another. The floors in such instances are constructed in two ways. First, a laminated floor in which thin pieces of wood, one, two or three inches thick by a depth of from five to eight inches, are nailed together sideways so as to make a solid slab of wood of sufficient thickness and strength to carry the load from one row of columns to another. One slight trouble from this construction is that after the building is finished and begins to dry out, the pieces of the floor slabs shrink and sometimes allow considerable dust and dirt to fall which had become wedged in these cracks during construction. This objection, however, has not been found sufficiently great to prevent the adoption of this style of construction in many buildings. The other style of constructing the thick floor slabs which span directly from one girder to another is the splined floor construction. This is made out of heavy plank, about eight inches wide and four



CHICAGO JUNCTION TERMINAL BUILD-
ING. S. SCOTT JOY, ARCHITECT.



JAMES M. TAFT MACHINE SHOP, CHICAGO.
S. Scott Joy, Architect.

or more inches thick, according to the strength required. On each side of each piece of this floor plank is a groove about an inch wide and an inch deep, into which the spline or piece of wood about one inch thick and two inches wide, is placed and forms a union with the next piece just as a tongue does on the ordinary piece of flooring. Each piece of this heavy flooring is spiked by one spike ten inches or more in length through its center into the girder. It may also be toe-nailed to the girder first with small spikes so as to drive it up before the big spike is driven. This method has the advantage of preventing the dust and mortar from going through which was deposited on top during the building operations and it also has the advantage of being rapidly constructed during building operations.

In considering the cost of the two types of mill construction above described, it should be taken into account that no floor joists are employed and that therefore this lumber can be utilized to increase the thickness of the floors without adding any material additional expense on account of the extra thickness of the floors.

Both of the above methods of construction of heavy wood floor slabs, spanning

usually about fourteen to sixteen feet between girders, will carry easily a live load of one hundred and fifty pounds, and even more than double this amount if desired, provided the posts are properly spaced and the construction is made extremely thick and heavy. One characteristic of this kind of construction should be reckoned with; that is, that in the middle of the span the floors are more flexible than in other kinds of construction, and consequently rapidly revolving machinery might set up a vibration in the floors that would be objectionable. The spaces over the girders, of course, are as stiff and rigid as such spaces are in any kind of mill construction.

Concrete construction is now usually built in two ways. First, the flat slab construction where there are no girders or floor joists, but where there is a head or cap at the top of each column that carries the entire load of the floors. The floor slabs in such cases are generally eight or nine inches in thickness and the spans between posts from eighteen to twenty-five feet. It is desirable, if possible, to have the spans between columns the same in each direction. Such floor construction has the advantage of perfectly smooth ceilings and absence of

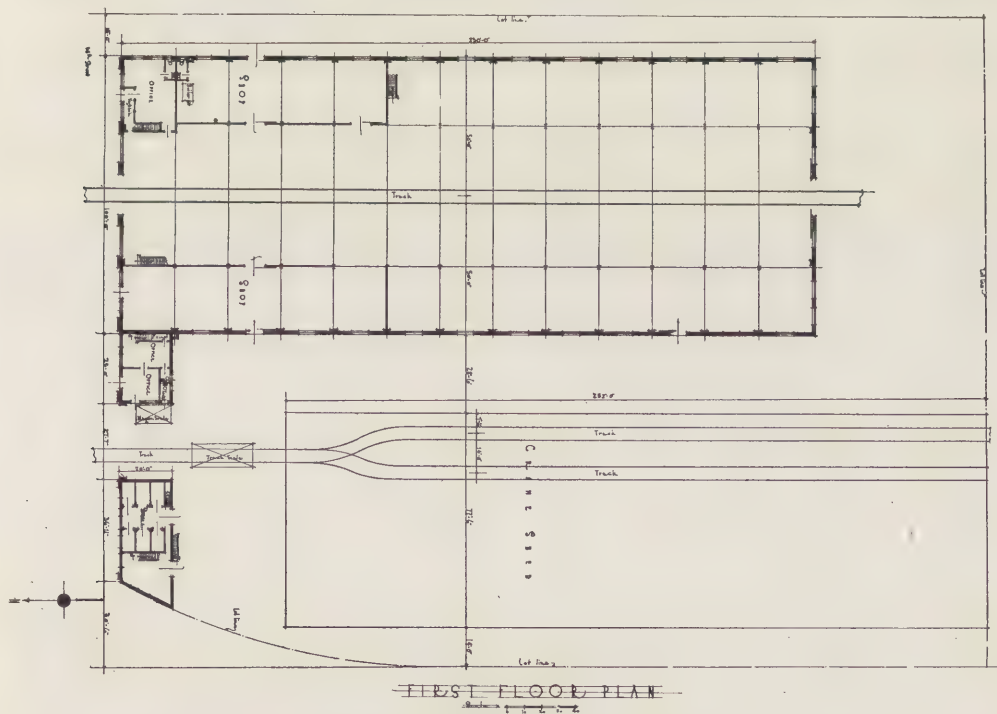
projecting girders or beams to intercept the light, the running of pipes, etc. The second form of construction is that where the floor is supported by means of beams and girders just like the corresponding familiar type of mill construction. The floor slabs in this case are usually thin, about four inches or more.

Both of the above types of construction are capable of sustaining great loads, but they are not so economical for light floor loads as is wood construction, that is, the difference in cost between mill and concrete construction increases rapidly in favor of mill construction as the floor load is diminished. The alteration or moving of partition walls in such a building is easily accomplished because they are carried or supported independently by each floor; cutting holes through floors of any material size is of course more difficult than in mill construction, but the coming of pneumatic tools and the acetylene flame for burning steel has made this operation much less expensive and troublesome than it formerly

was and has even made practicable the entire wrecking and removal of a concrete building.

Prior to the war, the cost of a concrete building was sometimes no more than that of a mill constructed building, if the loads which the floors were to carry were heavy; that is, over 150 pounds or upwards per square foot. In other cases, the difference between concrete and mill construction was not often more than five to ten per cent. excess cost for the concrete building.

The distance between posts in a mill building must necessarily be less than that in a concrete building, for the reason that timbers cannot be secured of sufficient size to carry the loads imposed by wide spans. If steel girders are resorted to in mill building, then metal columns are almost a necessity; and the cost will be increased beyond that of a concrete building. The mill building is subject to dry rot and decay in its structural parts; also to checking and splitting of the large timbers, which necessitates



JAMES M. TAFT MACHINE SHOP, CHICAGO.
S. Scott Joy, Architect.

renewals never required in the concrete building. The durability of the concrete building is probably greater than we have yet had an opportunity to determine. The allowable areas between fire walls are much greater in concrete than in mill buildings as defined by most building ordinances.

The fire insurance rate on a mill building constructed according to fire insurance requirements and equipped with a sprinkler system is very little higher as a rule than it is on a concrete building. The relative cost of materials in different localities, depending upon the distance of shipment, is of course a feature that affects the price primarily. The concrete building, however, is the more durable and consequently a better asset for the property; it will not feed the flames in a great fire with the material contained in its structure; its floors are waterproof if properly built so that heavy water damage does not take place; it is stiffer and stronger in construction; it has all the adaptability of uses for ordinary industry and it requires less cost maintenance than the mill building. These are the principal advantages in favor of reinforced concrete construction. Unless there are special reasons which may grow out of the nature of the site or the requirements of the business, the best proposition for an industrial plant is reinforced concrete. Reinforced concrete does not necessarily mean unsightly concrete walls and supports. These may be veneered with brick, terra cotta or whatever material desired. Although brick may be used in the outside piers, it is never a good plan to rest concrete beams, girders or floor slabs directly on self-sustaining masonry piers or walls. The stiffness and strength of a concrete structure are by such means largely taken away, and it has been found that almost every concrete building should be designed so as to have a reinforced concrete skeleton structure in the outside walls and fire walls just the same as is employed in the ordinary steel skeleton fireproof construction.

Some buildings have been built with a steel skeleton like that of an office building, with reinforced concrete between the

beams. This is good construction, but its cost far exceeds that of a reinforced concrete structure; and unless the building goes too high in the air, it is a waste of money to employ structural steel in this way. Although concrete buildings are built as high as sixteen stories, the columns in such structures in the lower stories naturally become so large in size that they are an obstruction and a waste of floor space. In buildings even eight, ten or twelve stories high, metal columns, at normal prices, can often be utilized in the lower stories to good advantage.

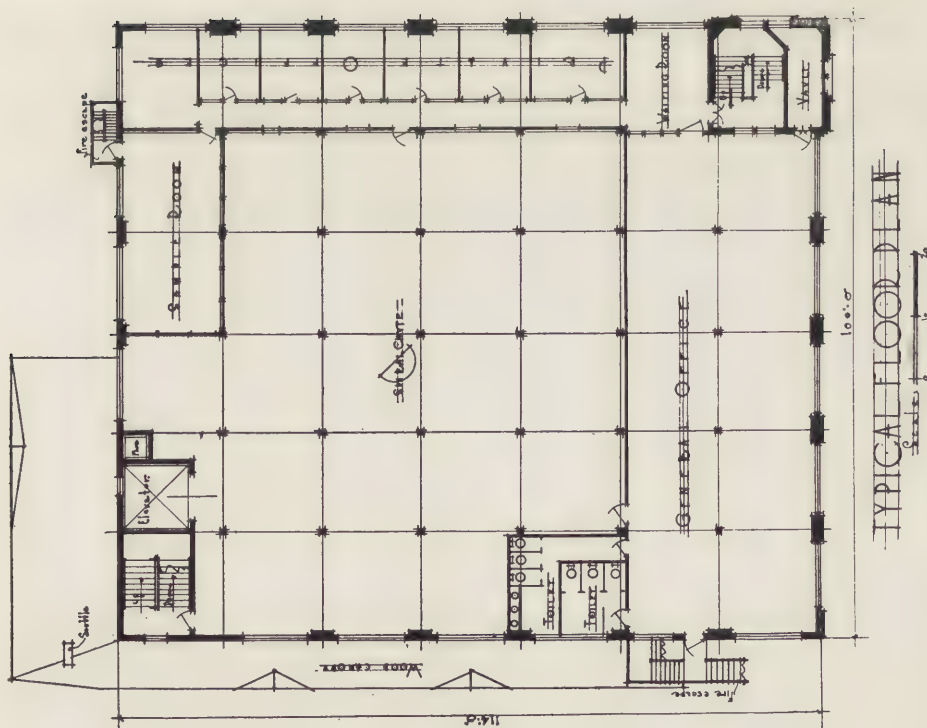
In the early history of concrete construction, there was a series of most lamentable accidents. These were due to causes which those properly experienced with concrete now know how to avoid. There is no longer any question of experiment in designing or erecting concrete buildings. It is entirely a matter of science and mathematics in design, the safety of which can be proved and checked; and the erection can be done by methods largely mechanical that are safe and sure. However, no one in erecting a concrete building should ever overlook the fact that his responsibility is greater than it would be with any other type of construction. It requires the most constant, intelligent and faithful supervision in every detail from start to finish.

Concrete construction is most interesting when you think of what happens when it is made. Its ingredients, a pile of sand, stone and a little cement, with a few bars of steel, as they lie on the ground, are apparently the most inconsistent things in the world to combine for great strength; yet when they are mixed with a little water, a transformation takes place that seems to accomplish in a few days, what nature required thousands of years to do when she made her rocks, only man's concrete rock has steel ribs in it at the right points to give it a strength many times that of nature's.

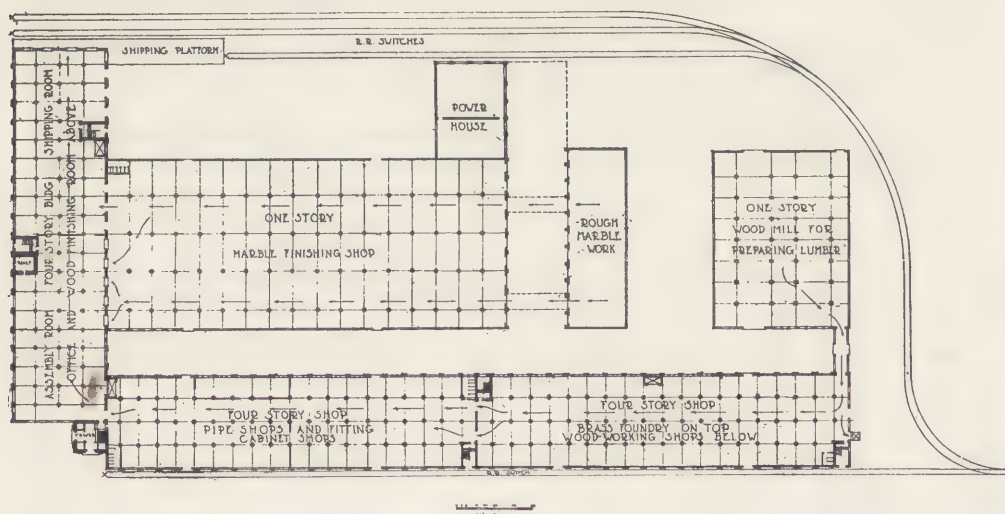
The last type of building construction mentioned above is the steel skeleton, where the supports of the building are made of the larger steel structural shapes, such as "I" beams, channels, angle irons, "Z" bars and plates, fabricated into vari-



NORTHERN JOBBING COMPANY BUILDING, CHICAGO.
S. Scott Joy, Architect.



NORTHERN JOBBING COMPANY BUILDING, CHICAGO.
S. Scott Joy, Architect.



PLANT OF THE LIQUID CARBONIC COMPANY, CHICAGO.

Nimmons & Fellows, Architects.

Soda water fountains are the principal product of this plant. The travel of materials and the general flow of production are indicated by the arrows. The rough lumber is cut into required sizes in the wood mill on the right and from there it is fed into the right hand end of the long four-story building, where it is transformed into counters and all the other wood parts of a fountain, while it travels to the left together with all the fittings, brass and nickel parts, which move along towards the assembling and shipping room, where they are joined by the marble and onyx parts from the marble shop.

ous kinds of columns to support the floors which consist of a system of "T" beams, girders and channels filled in between with fireproofing tile or a similar substance, and provided in the outside walls with brackets and shelving to support the brick, terra cotta or other material which encloses the building.

This type of construction is the most wonderful of our age and has not only produced a revolution in building methods, but has also played havoc with all former theories and principles of the architectural design of buildings. The material and the manner in which it is used are so strong and powerful that this mode of construction has upset all the former ideas and standards of the relation between the size of supports and the load which they carry.

Most office buildings, hotels, theatres and other important buildings in the center of American cities are of this construction. It is excellent for industrial buildings; and as a rule there is no objection whatever to its use for such purpose, except that its cost is materially greater than that of reinforced concrete and that its floors, as usually constructed, allow water to go through them like a sieve, which in case of a fire or a premature discharge of sprinkler heads may cause serious damage all the way to the basement.

In laying out an industrial plant the apparently simple and innocent operation of spacing columns of support has much more of an important part to play in the operation of the plant than may at first appear. If the plant is to be laid out on a city site where the scarcity of ground permits little or no unoccupied space, the dimensions of the property may influence the spacing of columns to some extent by not being of the exact dimensions required for dividing up exactly into the number of column spaces at the span desired. This may often be overcome by adopting the spans desired for the great majority of the cases, and changing one or more spans at such places as elevators, stairways or outside walls, where a difference in spans might not at all interfere with the production. Econ-

omy of construction demands that the length of spans shall be regulated according to the materials used. Mill construction, if the building is small and the timbers and planks are to be taken from stock, should have the spans of posts such as to accommodate stock sizes which run in even numbers of feet. For the ordinary mill building, material is usually taken direct from the forest and cut up into sizes required so that any dimensions can be utilized with economy so long as they are not too large or too long. Mill construction spans must, on account of the nature of the material, be shorter than those of concrete.

The most important considerations, however, in determining spans are the requirements of the business, the size and kind of machinery equipment employed, and the kind of lighting to be supplied. The spacing of columns makes a great difference also in the amount of light obtained through the outside windows. The shorter the spans, the less glass area can be placed in the outside walls and the darker the interior of the work shop will be.

In the Architects and Builders Journal (England, 1915) in a report on data gathered from eighty thousand factories as to the cause of accidents to employes, it was found that the majority of them were due to the lack of light.

The Journal of the Royal Institute of British Architects also gives an account of calculations of the loss sustained in a factory when the efficiency of the workmen was affected to the extent of ten per cent. by reason of lack of proper lighting.

One would not have to go very far among American factories to find instances where the employes' efficiency at times was affected to this extent, from the lack either of natural lighting or of artificial lighting. In plants where the payrolls amount to hundreds of thousands annually, the saving in production costs that could be made by proper lighting would pay for a lot of windows and a lot of good talent to place them in the parts of the plant where they would do the most good.



VIEW SHOWING NATURAL BEAUTY OF
THE SITE OF UNION PARK GARDENS.

UNION PARK GARDENS

A MODEL GARDEN SUBURB FOR SHIPWORKERS at WILMINGTON, DEL.

*Built for the United States Shipping Board,
— Emergency Fleet Corporation —*



BALLINGER & PERROT, ARCHITECTS & ENGINEERS
JOHN NOLEN, TOWN PLANNER

By William E. Groben

THE influx of shipworkers to carry out the shipbuilding program of the Emergency Fleet Corporation overtaxed and exhausted Wilmington's housing facilities. When it became evident that such facilities were inadequate; that because of the advance in cost of labor and materials and the uncertainty of supplies for construction work, the erection of new homes was not keeping pace with the rapid expansion of existing shipyards, and that no provision was being made for accommodating additional workmen for the proposed new shipyards, the Liberty Land Company of Wilmington was organized to meet the housing requirements. After obtaining options upon several available and convenient sites, the company conferred with the Emergency Fleet Corporation, and, as a result, the Union Park Gardens development, one of the many housing projects now in course of construction, was undertaken.

The site is relatively high, at an elevation considerably above the main business district of Wilmington, one of the most active industrial centers south of Philadelphia, situated on the Delaware River, and having an estimated population of 110,000. It is located at the intersection of Union street and Lancaster avenue, on the outskirts of Wilmington, partly within and partly without the city, and comprises about fifty-eight acres of beautiful rolling farmland, one portion of which, adjoining the woodland section to the south, at present reserved as

parkland, is heavily wooded with magnificent trees. A brook, a special feature of the plan, flows through the tract. To the south is the parkland just mentioned, with Lancaster avenue and Union street on the north and east respectively, the latter being the main highway to Baltimore and Washington; on the west is Cathedral Cemetery.

A matter of particular interest and worthy of special mention is the purchase of adjacent property for the protection of the land values created by this new development. Beyond the original limits of the tracts and on the north side of Lancaster avenue were a number of disreputable shacks and negro hovels, while on the east side of Union street the land was unimproved by buildings of any sort. These two tracts were purchased because of their vital importance to the project and the limits of the tract were accordingly extended to include them. This procedure enables the Liberty Land Company to secure and maintain the increased property values which are being created by this new development, and, at the same time, to prevent the speculative land operator and builder from depreciating the character and quality of the new project by the erection of cheap and unsightly rows of houses or stores, which would unquestionably have occurred. As a result the architects have been able to design the buildings, etc., on both sides of Lancaster avenue and Union street, thereby insuring their uniformity in appearance.

The opportunities offered by the natural advantages of the site and its unusual surroundings have been fully appreciated and utilized to create an American Garden Suburb of exceptional merit. The site is connected with Wilmington proper and its shopping district by two trolley lines, one on Union street and one on Lancaster avenue, the latter giving direct transportation to and from the shipyards of the Pusey and Jones Company, the Harlan plant of the Bethlehem Shipbuilding Corporation, and the American Car and Foundry Company, all of which may be reached in ten minutes.

PLAN ARRANGEMENT.

The town plan of Union Park Gardens, the conception of John Nolen, has been arranged to form part of the city of Wilmington, which it adjoins, by continuing some of the present city streets through the tract.

The plans include all the essentials of a thoroughly organized garden suburb. In addition to the houses and apartments, there are to be a Community building, a school, and a requisite number of stores to meet immediate local needs. The already existing police and fire stations of Wilmington, just beyond the limits of Union Park Gardens, eliminates the necessity of providing for such service. Likewise, because of the present park bordering the tract on the south, no consideration had to be given to the reservation of extensive park areas. A large, modern and completely organized public school, less than a quarter of a mile distant, materially aided in solving the educational problem for the development itself.

In determining the general plan arrangement, the Communal building, apartments, stores, and public garage were located on Union Street and Lancaster avenue, in and about the vicinity of their intersection, the garage being placed at the rear of the stores. This scheme was the obviously logical arrangement, because of the proximity to Wilmington proper, and the fact of existing traction lines on both these thoroughfares; thereby keeping heavy traffic from other streets in the devel-

opment and producing residential privacy for the houses themselves. Aside from the fact that the majority of the group houses have been located as conveniently as possible to the traction service, there has been a judicious placing of two-family houses in the most desirable locations, namely, on Grant avenue and at the southern end of the tract among the trees, and near the park.

PLOT AND STREET LAYOUT.

By introducing curved thoroughfares to avoid excessive cut and fill; by connecting with only the principal adjacent and already established streets, and by dividing the tract into blocks of varying sizes and shapes, so that none would be either too long or too wide, Mr. Nolen, the town planner, has succeeded in evolving an extremely ingenious and practical plan, in spite of having to conform, in a great measure, to the existing old-fashioned, checker-board street layout of the city of Wilmington. By limiting the curved element to the longer, main thoroughfares only, a modern and scientific layout has been obtained which presents sufficient opportunity for variety in treatment, due to the resulting irregularity of blocks and plots, without either complicating the simplicity of the plan or unduly increasing the practical difficulties in the surveying of streets and building lots, an objection frequently advanced against the use of curved lines.

Grant avenue, already partly constructed, which, when finally completed, will connect Wilmington's system of public parks, enters Union Park Gardens at the Village Green, and continues through the development and the park beyond. It is a broad, curving thoroughfare, averaging one hundred and twenty-five feet in width, following the course of the stream previously referred to, which gives it the charming effect of varied vistas. The roadways proper are on either side, with an intervening space, beautified by a pool and spillway spanned by a rustic bridge. Minor public open spaces, with suitable approaches, have been created at the intersection of the more important thoroughfares to produce a variety of view-

points. This is particularly true of the Village Green, which not only gives a more appropriate setting to the communal and apartment buildings, but opens the view in many directions to vistas of the most charming character.

side of which are 20-foot roadways, having a 7-foot planting strip and a 6-foot sidewalk on the property side only. The latter are fifty feet and forty feet in width, between property lines, having roadways of twenty-four feet and twenty



MAP OF WILMINGTON, DEL., SHOWING RELATION OF UNION PARK GARDENS, AT LOWER LEFT HAND CORNER, TO SHIPYARDS ON THE RIVER FRONT.

Careful distinction has been made between principal and secondary streets, not only to effect economy in the cost of street construction and maintenance, but to preserve the residential character of the development by encouraging the use of the principal and wider streets for through traffic, and the secondary narrower streets for local traffic. The former include Lancaster avenue and Union street, which are both to be eighty feet in width, having 36-foot roadways, 14-foot planting strips, 6-foot sidewalks, and two feet between sidewalks and property lines; and Grant avenue, one hundred and twenty-five feet wide, consisting of a central planting space on either

feet from curb to curb respectively. Between the curb and the 5-foot wide sidewalks of these streets, there is a planting space of seven feet on the wider streets, and five feet on the narrower ones. A noticeable peculiarity of the plan is the fact that, with one exception at the southwestern corner of the tract, none of the streets continue beyond the tract on the west side because of the Cathedral Cemetery.

To those familiar with scientific town planning, a glance at the general layout attracts attention because of the absence of service drives between blocks at the rear of the group houses. The original scheme included 15-foot wide driveways

of this sort, to reduce vehicular traffic on the main thoroughfares, and to facilitate the delivery of household commodities and the collection of ashes and garbage. With the inauguration of the "cash and carry" system by the stores, the delivery question no longer required serious consideration. On account of insufficient appropriations and of existing city ordinances which limited cleaning, lighting and removal of ashes and garbage to streets only, together with the question of adequate policing, the authorities of the City of Wilmington could give no assurance of extending such facilities to service drives. The situation was fraught with further difficulties due to the fact that, although Wilmington would undoubtedly be extended in the near future to include the entire development, at the present time the greater part of Union Park Gardens is outside the city limits. Obviously there was no alternative other than the elimination of all service drives. The ingenuity of the architects was taxed to the utmost to arrive at a solution which would be satisfactory to all parties concerned, with the result that the novel, yet simple, expedient of introducing front areaways, whereby ashes and garbage could be removed conveniently and directly from every group house, was determined upon. This feature has a twofold advantage: first, reducing the expenditure for road construction, thereby effecting a material saving in the cost of the project; and, secondly, making it possible to increase the depth of each plot by half the proposed service drive, or seven and one-half feet. The writer has dwelt at some length on this feature, because, in his opinion, the architects have successfully introduced a new element in the solution of the rear service drive problem in connection with group housing.

LAND SUB-DIVISION.

The plots for intermediate group houses, between parallel streets, although not conforming to any absolutely uniform dimensions, generally average from sixteen to twenty feet frontage by ninety-five to one hundred feet depth. End plots of this same depth have a

somewhat greater frontage; in order to maintain a sufficient distance between groups. Although sixteen feet has been taken as the accepted minimum distance, it has been possible to secure eighteen feet or more in practically all instances. Plots for the detached and semi-detached houses have a frontage varying from thirty to fifty feet, depth irregular. The distance between houses on opposite sides of the street, depending upon whether the minimum 20-foot or the maximum 30-foot set-back is used, varies from eighty feet to one hundred feet on the narrower streets, and ninety feet to one hundred and ten feet on the wider ones. Allowing for the depth of each house, there remains a distance of ninety to one hundred feet between rear walls of houses; which space is more than sufficient for an abundance of light and air.

This project contemplates five hundred and six houses, of which three hundred and ninety-nine are of the group type, one hundred and four semi-detached, and three detached. After allowing sufficient ground for the apartment houses, stores, community building, school and playground, there will remain a few lots which may later be purchased and built upon. A site has been reserved for a future school building, with an adjoining playground for baseball and tennis. In addition, two reserved areas, unsuitable for dwellings, are to be devoted to allotment gardens, for those who would not otherwise use their own back yards for this purpose.

The chart reproduced herewith shows the proportion of land allotted to the various purposes. Of the total area of 58 acres, 35 acres, or 60.30 per cent., have been used for strictly residential purposes, 32.14 acres for the 514 house lots, and 2.86 acres for the three apartment lots, the latter having a total of forty apartments. The remaining 23 acres, or 39.70 per cent., represent seven and two-thirds acres, or 13.20 per cent., for a future school and its adjacent playground, community building and parks; nine-tenths of an acre, or 1.55 per cent., for reserved spaces to be used for allotment gardens, and 14.44 acres, or 24.95 per cent., for streets. The density of hous-



TOWN PLAN OF UNION PARK GARDENS.
 Figs. 1, 2 and 3—Apartment Buildings.
 Fig. 4—Community Building. Fig.
 5—School. Fig. 6—Public Garage.



TYPICAL BLOCKS, SHOWING GROUPING, SET-BACK, ETC., IN
PLAN AND ELEVATIONAL COMPOSITION IN BLOCK UNITS.

ing, calculated on the basis of 514 families in separate houses and 40 families in the three-apartment, occupying a total of 35 acres, is 15.83 families per net acre.

Excluding the apartments, and using 514 houses, which occupy 32.14 acres, as the basis of calculation, the density is 16 houses per net acre. This intensification of housing, 15.83 families per net acre, or 16 houses per net acre, is made possible by the use of the group house. This development very forcibly illustrates the possibilities of the group type of house in the successful concentration of housing, when scientifically planned. It is worthy of note that, notwithstanding this density of housing, only 24 per cent. of the 32.14 acres devoted to house lots is occupied by the houses themselves, which conforms to the generally accepted standard of density as recommended by English authorities on garden suburb planning. The remaining 76 per cent. is unoccupied and consists of lawns, which, with the additional area of the streets, insures ample light and air.

ARCHITECTURAL TREATMENT.

The monotonous uniformity of rows of houses has been carefully avoided. In spite of the fact that the group scheme has been followed to a great extent, attractive and diversified effects in architectural design have been obtained by using both varying house set-backs and broken roof lines. Gable ends and dormers have been introduced at certain irregular intervals, especially at important points like street intersections, opposite streets, etc., with good results. Many of the houses have been given individual settings by taking advantage of certain irregularly shaped plots. There are twenty-odd different types of houses, arranged in a variety of combinations. The groups vary from three to ten houses each, separated by party walls, in units of both even and odd numbers. Only in two instances do they exceed this number, notably, one group of twelve and one of thirteen.

Harmony, simplicity, and uniformity of scheme have been maintained by adhering to one style of architecture, thus limiting the types of exterior treat-

ment; and by securing effects in mass and proportion, rather than by the introduction of useless and expensive architectural embellishments. Practical knowledge, common-sense requirements, and good taste have been exercised to make these houses essentially workingmen's homes, which can be placed within the means of the average skilled worker either to rent or purchase.

TYPES OF HOUSES.

The necessity of obtaining at least five hundred houses on this tract at the minimum cost per unit, consistent with proper construction and complete accommodations, made it obligatory to eliminate the single or detached house and to resort to the use of the semi-detached and group types. This, however, has been in no way detrimental to the project. Although the argument has been advanced that, to secure the maximum of light and air, the detached house offers the best solution of the industrial house plan, it must be borne in mind that these advantages are secured only at a greater cost of both land and construction. They, too, may be just as unsightly and monotonous as the group or row type, against which there is so much prejudice. In overcoming the objections to the group house by planning it only two rooms deep to secure abundant sunlight and ventilation in every room, certain advantages over the detached house are secured, namely, reduced cost of both land and construction; while the fewer exterior walls reduce the expense of heating to a minimum. At the same time, because of its better proportions, it offers greater possibilities for architectural treatment.

The houses are of four principal types:

1. The detached or single house—of which there is but one type.
2. The semi-detached house*—two-family or twin (double), of which there are two general types, D and D-3, having three variations each, D-1, D-2 and D-4.
3. The group house—having seven va-

*The term "two-family house," as used herein, signifies a house in which two families live side by side, separated by a party wall, and is not to be confused with the double-decker, in which two families live one above the other.

STATISTICAL STATEMENT					
LOTS (RESIDENTIAL)	ACREAGES		PERCENTAGES		LOTS
HOUSES	32.14		55.4		NUMBER OF HOUSE LOTS - 514 (506 TO BE BUILT UPON NOW) + 3 APARTMENT HOUSES APARTMENTS - 40 TOTAL 554
APARTMENTS A-B-C	2.86		4.9		
TOTAL		35.00		60.30	
SEMI-PUBLIC PROPERTIES					HOUSES PER NET ACRE 16.0
RESERVED SPACES	0.90		1.55		FAMILIES PER NET ACRE (554 ON 35 ACRES) 15.83
TOTAL		0.90		1.55	OF THE 32.14 ACRES 24% IS OCCUPIED BY HOUSES 76% IS UNOCCUPIED
PUBLIC PROPERTIES					AVERAGE LOT AREA .062
SCHOOL & PLAYGROUND	2.10		3.62		NORMAL LOT SIZE DETACHED 50ft x 100ft SEMI-DETACHED 45ft x 100ft GROUP 16ft, 18ft, 20ft x 100ft
COMMUNITY BLD'G.	1.07		1.84		
PARKS	4.49		7.74		
TOTAL		7.66		13.20	HOUSES PER GROSS ACRE 8.8 FAMILIES " " 9.38
STREETS					STREETS
MAIN	WIDTH 60-80 ft	2.05	3.57		MAIN 0.63 MILES
LOCAL	40-50 ft	9.22	15.90		LOCAL 1.67 "
PARKWAY (SPECIAL)		3.17	5.48		PARKWAY 0.80 "
TOTAL		14.44		24.95	TOTAL = 3.1 "
GRAND TOTALS		58.00		100.00	
REMARKS: <i>The boundary streets, Union Street and Lancaster Avenue, are main thoroughfares. One-half their width and length is included in the above calculations.</i> <i>The principal playground is to be provided in the present Public Park, south of Union Street.</i> <i>The area of the six stores, occupying part of the first floor of Apartment B, has not been deducted in the above schedule because there are apartments over them on the second floor.</i>					

DIAGRAM SHOWING PERCENTAGES OF PROPERTY ALLOTTED TO VARIOUS PURPOSES.

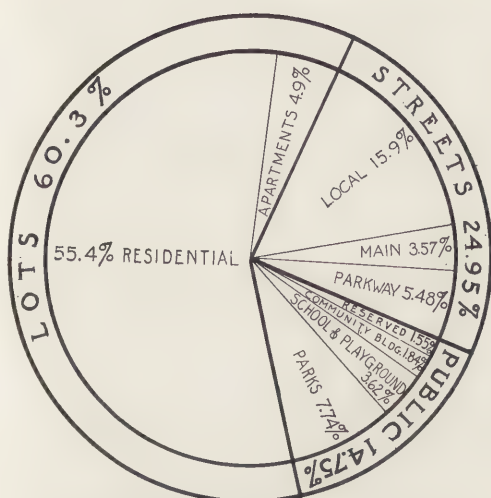


DIAGRAM SHOWING PERCENTAGES OF PROPERTY ALLOTTED TO VARIOUS PURPOSES.

riations of the intermediate houses depending on whether 16, 18, or 20 foot frontage, with four variations of end houses, depending on whether 16 or 18 foot frontage.

4. Apartment house: Realizing that the houses would be larger than required by many of the married workmen without children, it was deemed advisable to provide forty apartments, of which there are four types, consisting of three, four, five and six rooms and bath, respectively. These rooms include living room, dining room (which are combined in the three-room and bath apartments), kitchen, bedroom and bath on a single floor.

SEMI-DETACHED HOUSES.

TYPE D.

The semi-detached or two-family house, type D, of which D-1, D-2, and D-4 are modifications, has a frontage of twenty-four feet nine inches, and a depth of twenty-four feet eight inches, and is built upon lots of varying sizes. This house contains six rooms and bath: a living room eleven feet by thirteen feet eleven inches, having windows on three sides; a dining room eleven feet six inches by twelve feet, and a kitchen eight feet six inches by eleven feet, all on the first floor. The stair to the second floor opens from the end of the living room,

thereby making an attractive entrance feature. Another feature worthy of special notice is the clever arrangement of the rear kitchen entrance vestibule. This combines the entrance to the basement stair and a space for a refrigerator. The ice box is thus removed from the heat of the kitchen, but is still easily accessible to both the kitchen and the outside entrance. On the second floor are three bedrooms and a bath, the former having roomy closets, and the latter a linen closet, in addition to the built-in medicine closet over the lavatory. Two bedrooms, which are particularly attractive and spacious, are approximately eleven feet by twelve feet; while the third, somewhat smaller, is eight feet six inches by eight feet ten inches.

Attention is called to the ideal arrangement of types D-3 and D-4, in which all the first floor rooms and two of the bedrooms have windows on two sides, thus insuring excellent cross-ventilation.

Worthy of note is the simple but clever manner in which the architects have reversed the plan about the party wall in the semi-detached or two-family houses, to secure variation in the exterior architectural effect. A comparison of D and D-3 clearly indicates the method pursued in arranging the plan so that it would be flexible to this extent, thereby effecting economy in construction and labor by maintaining uniformity in the arrangement and size of rooms. This idea has been still further elaborated by utilizing the plan of half a semi-detached house, D-3 type, for the detached or single houses, in which windows have been placed in what was formerly the party wall.

GROUP HOUSES.

Intermediate Group Houses—

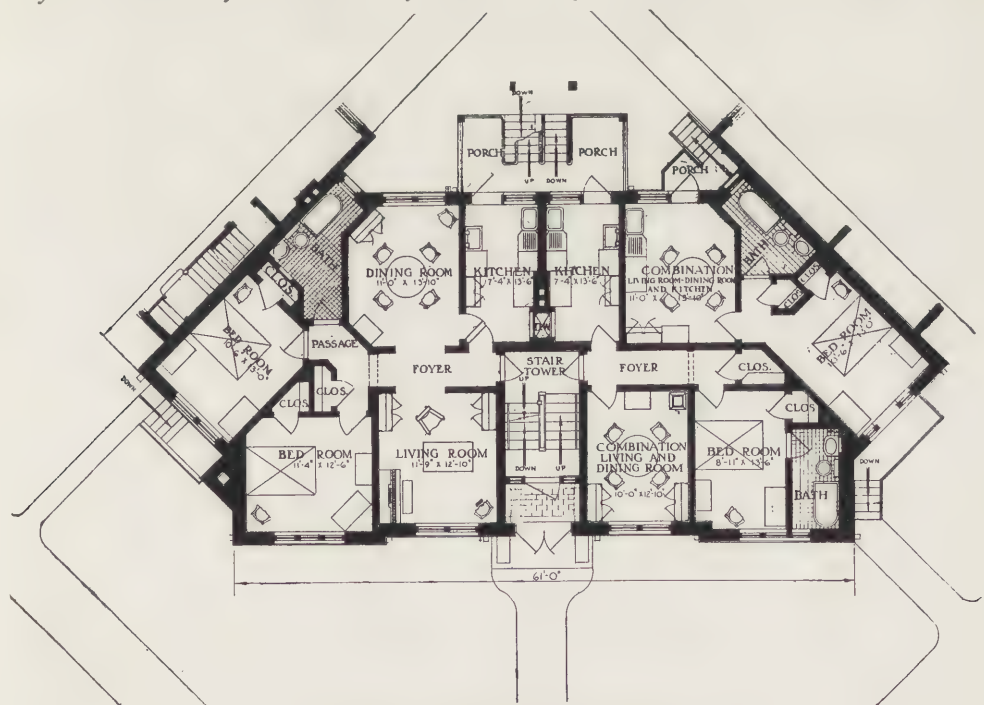
Types G-1 and K-3.

End Group Houses—Types M-1 and K.

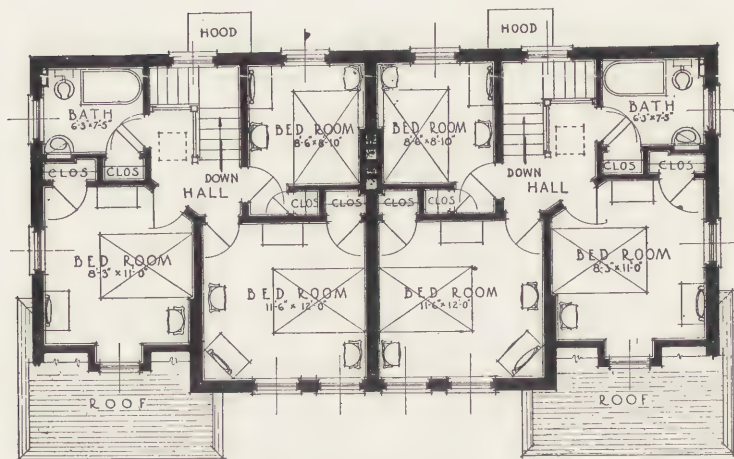
The group house is essentially the same as the semi-detached house in its interior accommodations. In the plan itself, a distinction has been made between intermediate and end group houses by increasing the depth of the latter to allow rooms of a larger size; and also, in

daylight in the front part of the basement, which is usually pitch dark in group houses. Two soapstone laundry trays are located in this basement, conforming to local custom. The use of the so-called "space saver," or laundry tray of which the cover acts as a drainboard for the kitchen sink, has been tabooed as a catch-all. Although it is frequently claimed that the installation of laundry trays in the basement, instead of in the kitchen, is inconvenient and increases the labor of the family washing because of additional stair climbing, in the opinion of the writer it has the advantage of removing the odors of the laundry from the kitchen, as well as preventing the laundered clothes from absorbing the odors of the cooking. Furthermore, in the winter months and in bad weather, the use of a dry, warm and well-ventilated basement for the drying of clothes is a real asset. While provision has been made for cooking and the heating of water by gas, a hearth and the necessary chimney flue have been included in every kitchen so that, if desired, a coal range may be conveniently installed at any time.

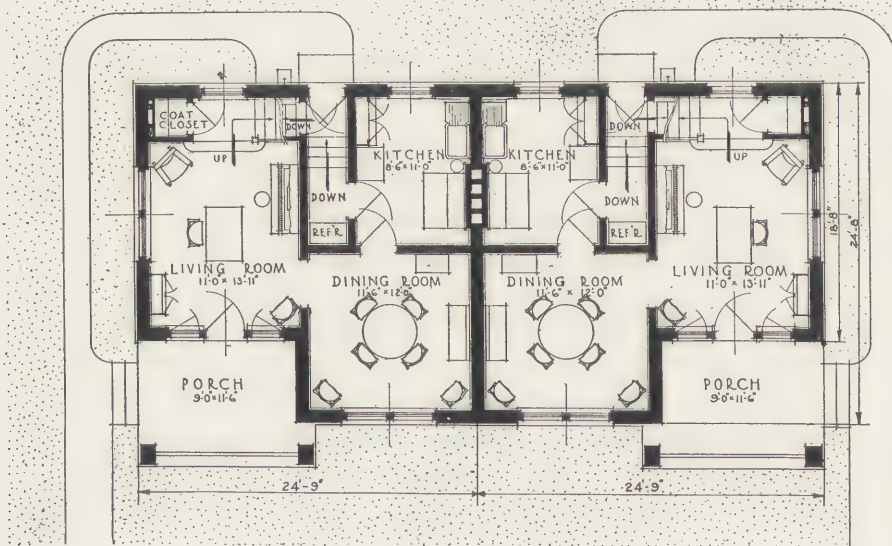
The kitchen fixtures have been located with reference to convenience and labor saving; the sink and its drainboard always with a window on one side to provide ample daylight and the range on the other side. There is also a built-in dresser for dishes and supplies, supplemented in many of the houses by a large closet for heavy kitchen utensils and bulky commodities. All bathrooms are entered from the second floor hallway only. They have composition floors, and are equipped with modern plumbing and fixtures, including a tub, lavatory and toilet fixtures. There is an ample attic space, well ventilated front and rear, to keep the bedrooms cool in summer. This attic has no living accommodations, but may be used for storage. A coat closet has been provided in nearly all living rooms, and every bedroom has at least one ample clothes closet. Besides a built-in medicine closet in the bathroom, a linen closet, for the storage of bedding and supplies, opens into the bathroom in the semi-detached house, and into the second floor hall of the group houses. Every house, except a few which have



TYPICAL APARTMENT BUILDING A.

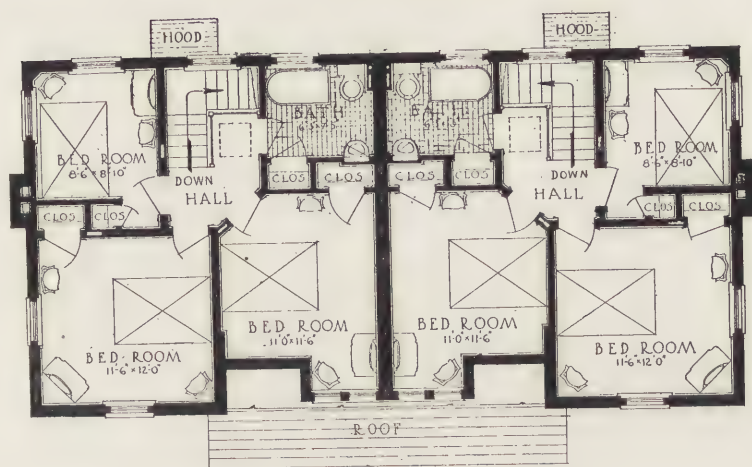


SECOND FLOOR PLAN

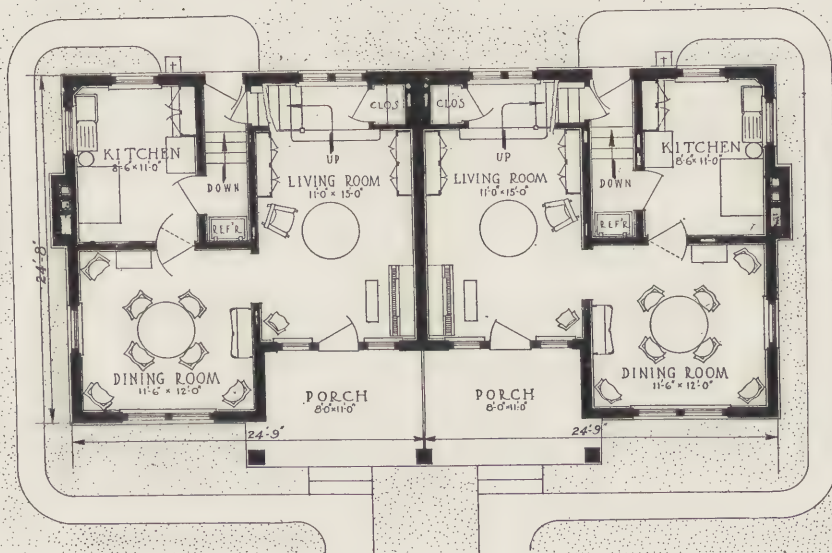


FIRST FLOOR PLAN

Type D, Semi-detached House: Each Unit, Six Rooms and Bath.
Types D and D-2 Are Similar in Plan, but Different in Elevation.



SECOND FLOOR PLAN



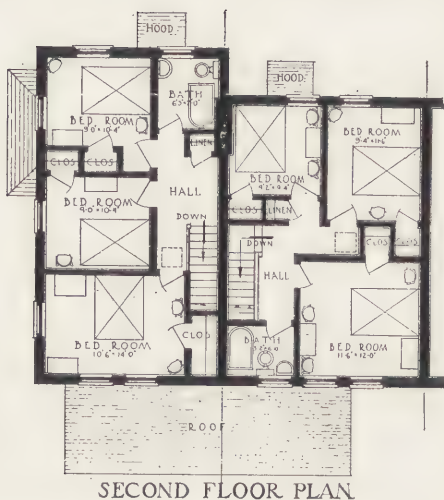
FIRST FLOOR PLAN

Type D-3, Semi-detached House: Each Unit, Six Rooms and Bath.

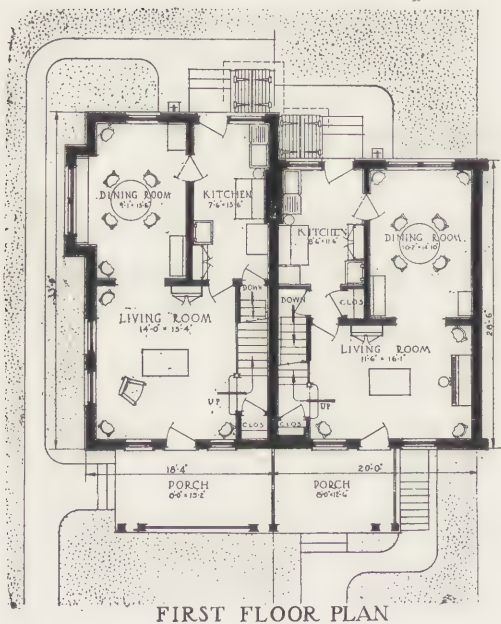
Type D-4: Similar in Plan, but Different in Elevation.

No. 6: All First Floor Rooms and Two Bedrooms Have Windows on Two Sides, Affording Excellent Cross Ventilation.

Type C: Single Detached House is One-Half of This Plan, with Windows in What is Now the Party Wall of the Two-Family House.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

Types M and G-1, Group Houses: Each Unit, Six Rooms and Bath.

open raised and cemented terraces with benches either side, has a front porch, which never extends the full width of the house in order not to exclude direct sunlight from the living room. Gas is furnished for cooking, and both gas and electricity for illumination by means of combination fixtures.

CONSTRUCTION AND INTERIOR FINISH.

Frame construction has not been used in this development. Stone masonry has

been generally used for basement walls, above which they are of brick and hollow tile, the latter houses and some of the brick ones to be stuccoed on the exterior. The roofs are slated, so that the entire development is both semi-fireproof and permanent in character. Public utilities, including sewers, water, electricity and gas, are being extended from Wilmington proper. The interior finish is yellow pine, a variety of colors being secured by staining it green, mission-brown, or golden-oak. The use of white as a color for interiors has been purposely avoided, because it requires constant cleaning and frequent repainting.

Ballinger & Perrot, the architects and engineers, have obtained excellent results by planning these houses after the "Air-light" design, making them only two rooms deep, thus affording each room the maximum of light and ventilation. This design has the additional advantage of affording rooms of ample size and a rectangular plan, which facilitates the use of standard-sized rugs, and a simple furniture arrangement. Thus, in both the design of interior accommodations and arrangement and the construction itself the architects have conformed to every requirement of the Housing Division of the Emergency Fleet Corporation.

COST OF CONSTRUCTION.

A detailed statement of the total cost of construction is not yet available. Even if it were, it could not serve as a basis of comparison for similar enterprises, as Union Park Gardens is an emergency development for the housing of shipworkers, in which rapidity of construction was of far greater importance than cost. It was impossible to obtain a reasonable lump sum figure because of the continually advancing prices due to the war. For this reason, and also to avoid delay in starting actual construction, the contract was let on the basis of cost, plus a fixed sum. The materials were purchased through the Construction Department of the United States Army. It was thus possible to obtain them in quantity at the reduced prices previously agreed upon between the Government and the dealers in building materials. This ar-

rangement had the added advantage of controlling the shipment of materials to the various Government operations as needed, thus avoiding any irregularity in distribution.

Quantity estimates were made for the various portions of the construction in advance of letting the contract, on the basis of which the cost of materials for each type of house was determined.

The city of Wilmington has agreed to reimburse the Government for the cost of the sewer system by cancelling the sewer assessment against the properties and paying its proportionate share, approximately two per cent. for street intersections, etc.; to pay five-eighths of the cost of street construction, excluding sidewalks; and to assume the cost of installing the water supply by its purchase upon completion. The gas and electric companies are to pay for the installation of their respective services up to and including house meters.

GARAGE FACILITIES.

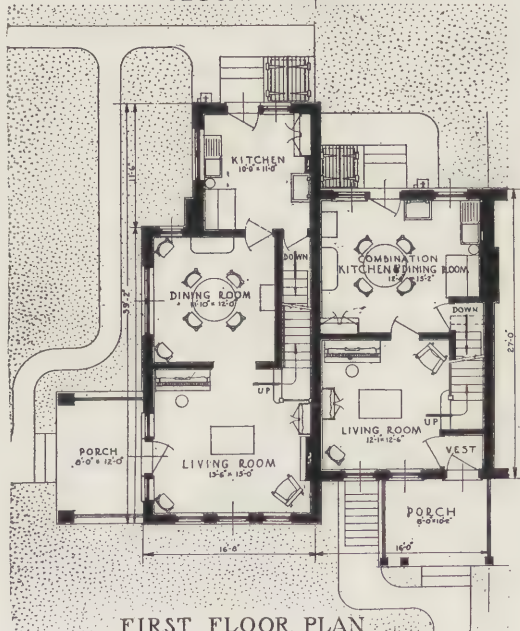
The question of providing individual garages has always been a much mooted one, of both the additional cost and the lack of sufficient information in advance of actual occupancy to determine, with any degree of accuracy, not only how many individual garages are likely to be required but also in connection with which houses they should be located. However, for the detached and semi-detached houses, whose occupants are more likely to possess automobiles, there is both ample ground at the rear of the property for a future garage and for access to it at the sides of those houses. If it is found that the public garage on Union street, near Lancaster avenue, is insufficient or inconvenient, it may become necessary to provide additional, more centrally located facilities by utilizing for community garages the two areas now reserved for allotment gardens.

LANDSCAPE TREATMENT.

That landscape work has a wholesome mental and moral effect upon the residents is indisputable. Landscape architecture, which frequently receives little



SECOND FLOOR PLAN



FIRST FLOOR PLAN

Types K and K-3, Group Houses: Each Unit, Six Rooms and Bath and Four Rooms and Bath, Respectively.

or no attention, as is evidenced by the unfinished appearance of numerous housing projects, is in this development to be under the able direction of Mr. Nolen.

The present trees and other natural beauties of the site have been preserved as far as possible. The streets are to be planted with hardy trees, and the space between the roadways of Grant Boule-



TYPICAL GROUP OF FOUR HOUSES.

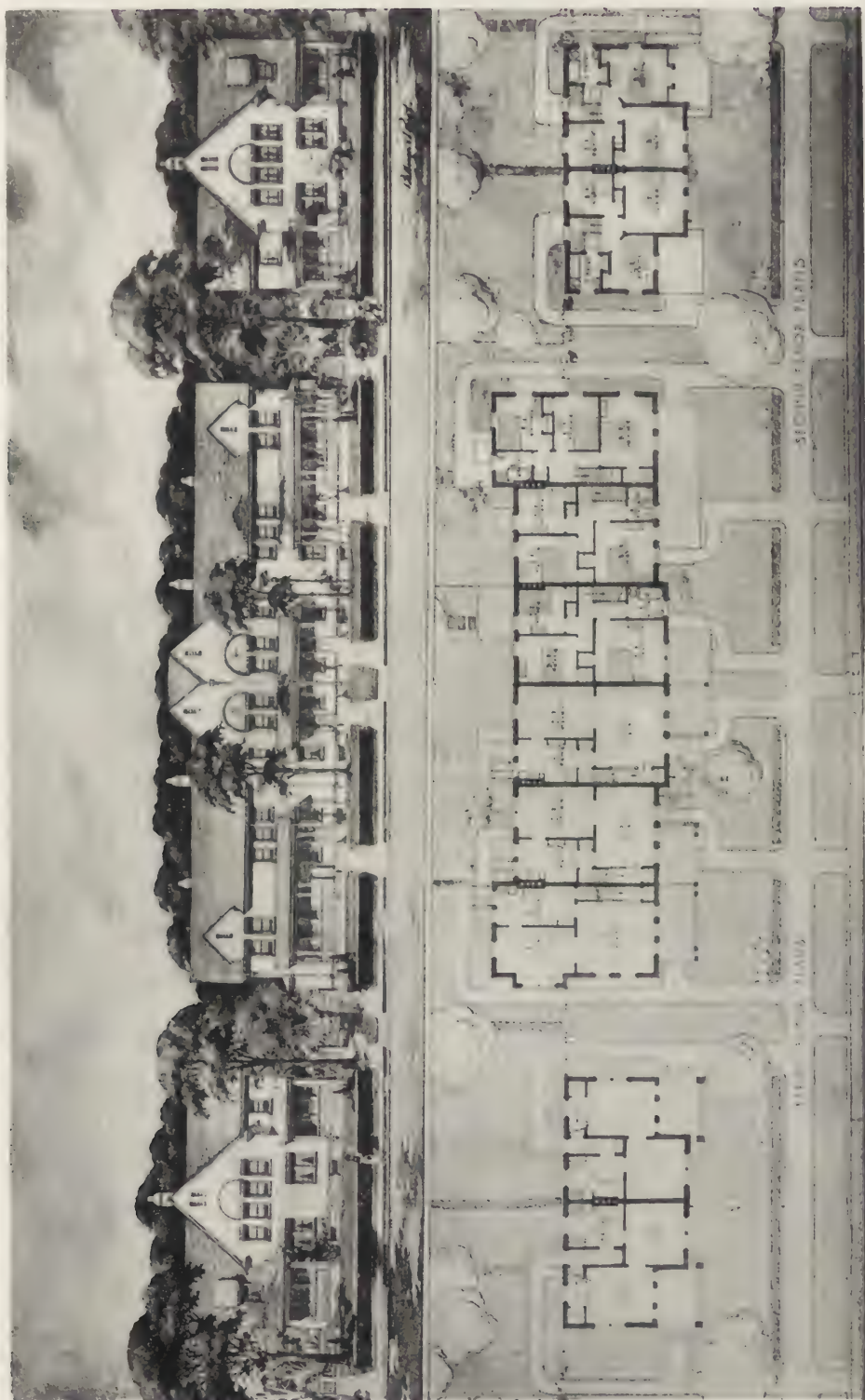
ward with both trees and shrubbery, which will not only beautify the tract, but will materially add to the intrinsic value of the property. The houses have been located with careful regard for their relation to street and property lines, the latter to be marked by hedges. Fences are to be erected on the rear property and party lines only.

COMMUNITY LIFE.

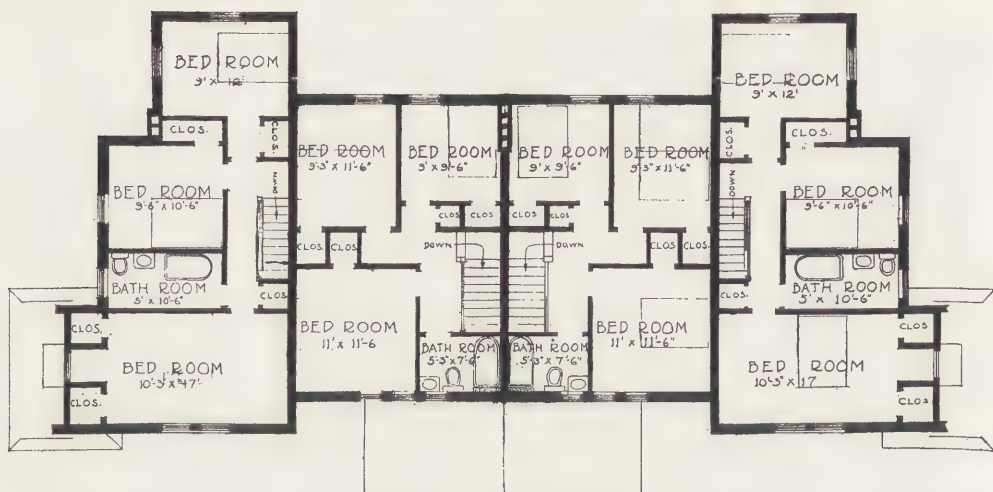
To foster the social life of the community and to cultivate a spirit of fellowship and neighborliness, a Communal building, with its various accommodations, is to be erected. It has been learned that in industrial communities for skilled workmen and their families, particularly for those brought from a distance, it is as essential to provide recreation and amusement as it is to provide adequate and sanitary homes. It makes for their well-being and contentment, which are the prime factors in eliminating, or at least reducing to a minimum, the labor turnover, the most serious industrial problem at the present time.

On the main floor of the Communal building, besides the necessary administrative offices for the management of the development, is an auditorium. This

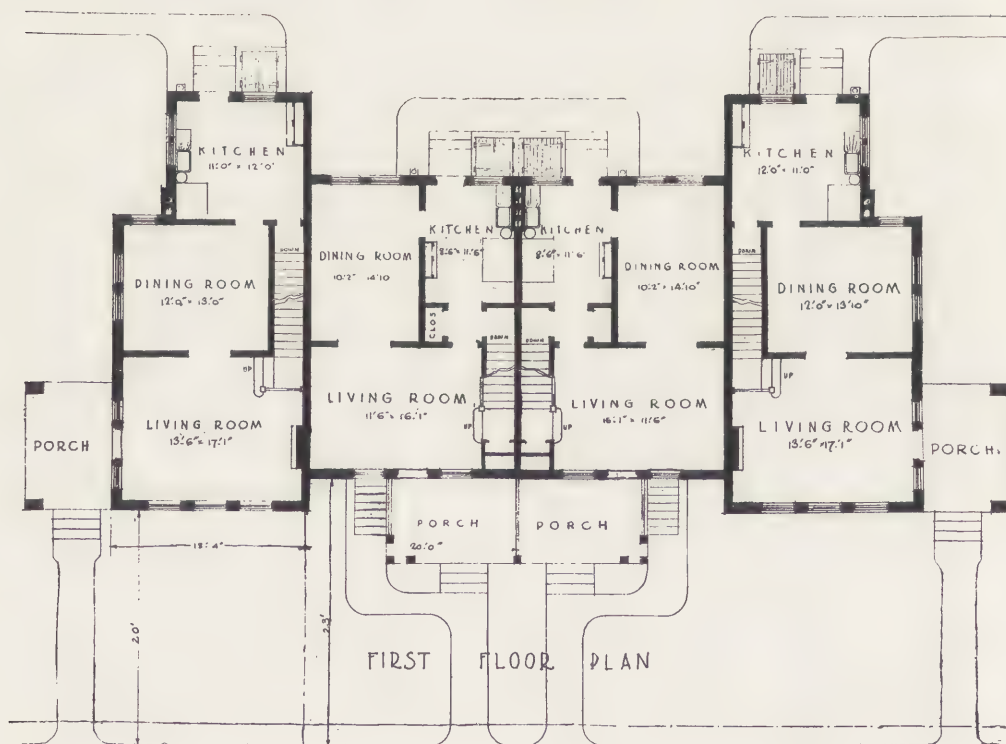
room, with stage, dressing rooms, and the rear balcony, will accommodate six hundred persons for lectures, moving pictures, gymnasium exercises, dances, and dramatic and social entertainments. In the rear of the auditorium is the swimming pool, with its spectators' gallery, exercise room, drying room and lockers, showers, and toilets for both sexes. Between the main entrance and the auditorium are a combined club and reading room and a lounging room, which have been designated a "Rendez-vous." The necessity of providing a place in the community, preferably in the Community building, where the workmen could congregate to express their personal opinions on matters of daily interest, a sort of round table, to act as a safety valve, was the fundamental idea involved in providing this "Rendez-vous." This is intended to supplant the saloon and the country store as a meeting place to discuss topics of the day. From an adjacent kitchen, sandwiches and light refreshments may be served to this room, and also to the auditorium. Across the front of the building is a second story, in which are located the social service and medical departments, and game rooms, including pool, billiards and cards. There is no



ELEVATION AND PLANS OF TYPICAL BLOCK, SHOWING TWO-FAMILY AND GROUP HOUSES. HOUSES ARE STUCCO, HALF STUCCO, BRICK OR HALF BRICK, DEPENDING UPON LOCATION. FRONT AREA ENTRANCE TO BASEMENT.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

FLOOR PLANS OF TYPICAL
GROUP OF FOUR HOUSES.

basement, except space for an engine and boiler room, etc. It is a very attractive one-story building, designed to harmonize with the architecture of the remainder of the development, and is located with streets on three sides and the village green on the fourth, at the entrance to Union Park Gardens.

SOCIAL WELFARE AND MEDICAL DEPARTMENTS.

The proposed policy of the management to establish social service and medical departments for the benefit of the community is, indeed, a commendable advance in connection with industrial developments. The social service feature, under the direction of a competent welfare worker, will undoubtedly prove of invaluable assistance in raising the moral standard and method of living by instructing in matters of education, health, home hygiene, care of children, house-keeping, including marketing, cooking, and sewing; and in social welfare and other interests of the community. The medical department will look after sanitation, water supply, care of sick and injured, and personal hygiene. These features, as well as the conduct of the Communal building, together with the organization of recreational features, including sports and athletics, maintenance of playground, lectures, entertainments, social amusements and field days, etc., are to be directed by the administration of the community, whose board will be composed in part of the workmen themselves.

SUPERVISION AND MANAGEMENT.

Wilmington was fortunate to have many progressive, public-spirited citizens, whose foresight and vision have made Union Park Gardens a distinct achievement. To them, and particularly to their Chamber of Commerce, is due the credit for realizing the urgent need for adequate housing. They organized the Wilmington Housing Company, which undertook to raise sufficient funds by public subscription to purchase the necessary land. Some one hundred and ten different individuals subscribed to the stock of this company, with the understanding that, while there was little pos-

sibility of financial return, the money would be used to purchase the land, which was to be given to the National Government, and upon which the latter would make a loan for the construction of the houses. This company advanced \$100,000 to the Liberty Land (or operating) Company, with which the land was purchased. This company in turn gave the Government a mortgage, covering the loan for construction work, agreeing to pay five per cent. interest per annum; and, after all operating expenses were paid, any unexpended balance was to be used to amortize the loan.

The Liberty Land Company proposes to rent the houses and not to sell them. The distinct advantages of preventing deterioration and depreciation of the properties, together with imposing certain property restrictions, are only secured by retaining control over the management of the development. Proper management and upkeep, so essential to the success of such a project, can only be maintained by renting—not by selling. At the same time this eliminates the objection so often advanced by the laboring class that the purchase of houses interferes with the mobility of labor; the freedom to seek better positions elsewhere. The rents to be charged will be controlled largely by existing rents for similar accommodations elsewhere in the city of Wilmington. They will vary from \$27.50 a month for the smaller houses for the average shipworker to \$50 for the larger single houses, of which there are but a limited number, for superintendents, etc.

In the near future the Government must determine upon a definite policy of administration for its various housing projects now in course of construction; by which they will be permanently insured the highest standard of maintenance and operation. This may be best accomplished by selling the properties on the installment plan to the tenants as a group, and not to individuals, represented by local limited-dividend, non-profit land companies. In this method of procedure, similar to the English co-partnership scheme of ownership, title remains in the original companies organized to hold the properties in perpetual

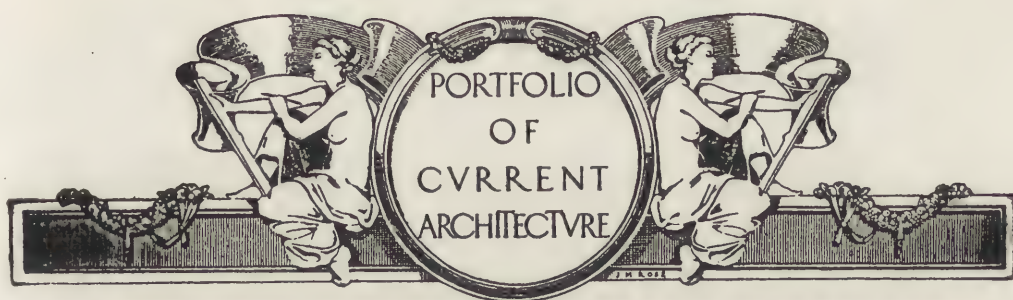
trust and to operate them as community investments for the benefit of the community as a whole. Since no advantage is to be taken of the profit resulting from the increase of land values due to the development of the communities themselves, the rentals, like tax valuations, must be adjusted periodically, and the surplus income from rentals used to pay the interest on and the amortization of the Government loans, thereby reimbursing the latter and enabling the communities to conserve the unearned increment of land values and to gradually purchase the land and houses at the original cost. The unearned increment is thus conserved by making it safe from private exploitation.

Instead of giving the tenants the advantage of this increment in the form of reduced rents, a better method consists of charging normal rents, corresponding to the rates charged for equal accommodations by private landlords in the vicinity. To make this possible, and to avoid increasing rents to meet the former charges, it will be necessary for the Government to write off, as a war expenditure, the excess cost of construction during war times as against pre-war construction prices. Abnormal rents not only compel the workmen to demand higher wages to meet the higher rents, thereby causing restlessness and discontent on the part of labor resulting in increased

labor "turnover," but also enables private landlords to profiteer by raising the rents of their properties. To charge lower rents than demanded by private landlords elsewhere operates to discourage private construction, which is not only badly needed at present but will be more so in the future. It gives also the wage scale an unequal value depending on whether or not a workman is fortunate enough to secure a house within one of the Government developments.

CONCLUSION.

In the past, scientifically planned industrial developments constructed along the most practical and economical lines have failed to achieve ultimate success because they have lacked the application of scientific method in the maintenance of health, efficiency and amenity. If the promoters of this development continue to display the same careful administration after its completion as has distinguished it throughout the constructive stages, namely, by instituting a policy of control by which to regulate and protect the community's interest and welfare, it is safe to predict that the city of Wilmington will have every reason to feel proud in having taken advantage of the unusual opportunity presented to make of Union Park Gardens an inspiration for similar undertakings elsewhere.



ENTRANCE TO LOWER TERRACE OF GARDEN—
ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BAR-
BARA, CAL. FRANCIS T. UNDERHILL, ARCHITECT.



SWIMMING POOL IN GARDEN—ESTATE OF
GEORGE O. KNAPP, ESQ., SANTA BARBARA,
CAL. FRANCIS T. UNDERHILL, ARCHITECT.



ENTRANCE TO LOWER TERRACE OF GARDEN—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



FORMAL SEAT IN LOWER TERRACE OF GARDEN—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



ENTRANCE TO SWIMMING POOL, WITH SANTA INEZ MOUNTAINS IN DISTANCE—ESTATE OF
GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



ENTRANCE TO SWIMMING POOL—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



SWIMMING POOL—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



VIEW SHOWING ELECTRICALLY CONTROLLED SLIDING ROOF OVER SWIMMING POOL, MOVING
ON A TRACK—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



ENTRANCE TO FOYER OF SWIMMING POOL—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



LOUNGE AND SMOKING ROOM OF SWIMMING POOL—ESTATE OF GEORGE O. KNAPP, ESQ., SANTA BARBARA, CAL.
Francis T. Underhill, Architect.



EAST FRONT—HOUSE OF W. R. SKILLMAN, ESQ., OLD ALBANY
POST ROAD, NEW YORK CITY. DWIGHT J. BAUM, ARCHITECT.



WEST FRONT—HOUSE OF W. R. SKILLMAN, ESQ., OLD ALBANY
POST ROAD, NEW YORK CITY. DWIGHT J. BAUM, ARCHITECT.



DINING ROOM NOOK—HOUSE OF VIRGIL
V. McNITT, ESQ., RIVERDALE-ON-HUDSON,
N. Y. DWIGHT J. BAUM, ARCHITECT.



REAR ELEVATION—HOUSE OF ARTHUR ELLIOT, ESQ.,
FIELDSTON, N. Y. CITY. DWIGHT J. BAUM, ARCHITECT.



HOUSE OF O. L. SCHWENKE, JR., ESQ., BAY
SHORE, L. I. DWIGHT J. BAUM, ARCHITECT.



RESIDENCE OF MRS. O. ZENKE, FIELDSTON,
N. Y. CITY. DWIGHT J. BAUM, ARCHITECT.



LIVING ROOM—HOUSE OF EDWARD C.
DELAFIELD, ESQ., RIVERDALE-ON-HUDSON,
N. Y. DWIGHT J. BAUM, ARCHITECT.



MAIN STAIRWAY—RESIDENCE OF FREDERIC
G. CARNOCHEN, ESQ., NEW CITY, N. Y. REN-
WICK, ASPINWALL & TUCKER, ARCHITECTS.
(Exterior views of this house shown in November.)



FIREPLACE IN LIVING HALL—RESIDENCE OF
FREDERIC G. CARNOCHEN, ESQ., NEW CITY, N. Y.
RENWICK, ASPINWALL & TUCKER, ARCHITECTS.



LIVING HALL—RESIDENCE OF FREDERIC G. CARNOCHEN, ESQ., NEW CITY, N. Y.
Renwick, Aspinwall & Tucker, Architects.



DINING ROOM—RESIDENCE OF FREDERIC G. CARNOCHEN, ESQ., NEW CITY, N. Y.
Renwick, Aspinwall & Tucker, Architects.



THE HOFFMAN PUBLIC SCHOOL, CINCINNATI, OHIO.
SAMUEL HANNAFORD & SONS, ARCHITECTS.

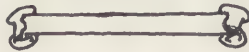


Architectural floor plan of the University of Minnesota School of Education building. The plan shows a central corridor with classrooms (25'0" x 30'0"), an auditorium (Seats 400), a stage, a lobby, and a teachers' area. The building is surrounded by a paved terrace and a girls' playground. A compass rose indicates North (N), South (S), East (E), and West (W). The plan is labeled "UNIVERSITY OF MINNESOTA" and "SCHOOL OF EDUCATION".

FIRST FLOOR PLAN—THE HOFFMAN PUBLIC SCHOOL, CINCINNATI, OHIO.
Samuel Hannaford & Sons, Architects.

The FURNITURE OF THE ITALIAN RENAISSANCE

AN APPRECIATION



By Walter A. Dyer

NOT long since I had the pleasure of inspecting a selection of modern American reproductions of old English and Italian furniture on view in a Fifth Avenue art gallery in New York. It was significant, in the first place, that it should be found in so exclusive a fine-arts environment. It reflected an increasing power of appreciation on the part of an influential, if small, section of the American public. In the second place, the exhibit was remarkable in several particulars. These pieces were something quite different from those reproductions, so-called, with which an easily cajoled public is edified in the department stores. They were carefully wrought copies of genuine antiques, made by skilled Italian workmen under enlightened American guidance. They were perfect reproductions, down to the last dent and worm-hole, finished thus not with the intent to deceive but in order to reproduce faithfully and sincerely the feeling, spirit, and decorative effect of the time-softened originals. As examples of craftsmanship they deserved the highest commendation.

All this, however, might have been set down to mere tricks of the trade if a loftier vision had not been manifest in the selection of the originals copied. One could not but feel that the whole problem had been approached with the loving but critical attitude of the connoisseur, who through study had learned to pick the wheat from the chaff. My first feeling of admiration for the workmanship was superseded by a newly stimulated interest in the significance of the designs themselves. A new train of thought was started and a desire to learn why these finest products of the craftsman of

sixteenth-century Italy should produce reactions of admiring pleasure which the bulk of furniture designs are powerless to arouse. Whence came the impulse which enabled those old craftsmen to fashion things better than their predecessors or followers, and in what respects were they better?

It is a wonderful thing, when you stop to think of it, that a group of men, living in a particular place at a particular time, should have been able to make such a commonplace thing as the building of chairs and tables blossom into one of the arts. It has not been done before, and all that we have accomplished since in this field has been but a development or refinement due to the adaptation of the things of the past to the requirements of an ever more complex life. In some way there was born in those men a sense of proportion and decorative beauty, as in the contemporary painters, such as had existed in a simpler degree among the ancient Greeks. It is a thing that comes but once in a human cycle and it can be only partially explained.

The Renaissance, to sketch briefly the situation, was a period marked by the revival of learning, a general emergence from the conditions of the Dark Ages, and new life in all branches of culture and art. This revival of learning produced a new interest in Greek and Roman antiquities. Peace, following long wars, reigned in Italy during this period and made it possible for the nobles and men of wealth to become patrons of the arts.

The Renaissance movement was European in scope, but it had its beginning, focus, and highest development in Italy. New life was injected into almost every

field of endeavor. There was a veritable outburst of intellectual energy, from which sprang discoveries, inventions, and the development and dissemination of ideas. These are the facts. The ultimate causes must be explained by the historian and the psychologist.

"During that period," says John Addington Symonds, "the entire nation (Italy) seemed to be endowed with an instinct for the beautiful and with the capacity for producing it in every form."

Another writer has termed this awakening "an exhibition of emancipated modern genius fired and illuminated by the masterpieces of the past." It was a natural, joyous, free feeling, almost childlike in its spontaneity, expressed in every field, a liberation of ideas marked by originality guided but untrammelled by the traditions of antiquity. The creative impulse was supreme; it was a Golden Age of achievement.

Straight back to the godlike Greek they went for the source of much of their inspiration, with an instinct as true as that of the homing bee. Roman and Pompeiian were drawn upon for what they could offer of beauty in detail and arrangement, but the Renaissance designer copied nothing slavishly. He was sure of his ground and he was not afraid to trust to his own invention. Nevertheless, the work of the Renaissance was not due to any mere demand for novelty—the thing which has marked most periods of decadence. The Renaissance craftsmen build upon secure foundations—the experience of their predecessors, a thorough understanding of the fundamental principles of design, and a native

instinct for the beautiful—the thing we vaguely term good taste.

Incidentally, there is an important lesson for us moderns in the steadiness with which the Renaissance designers, until the period of the baroque Decadenza in the seventeenth century, held fast to tried and true principles. When these principles are forgotten, and man cuts loose in the search for something different, he comes to grief. It was so in the extravagant Louis XV period, in the latter

years of Chippendale and of Sheraton; during the Victorian era, and in the craze for Mission and Art Nouveau to which we succumbed a few years ago. The periods of decorative improvement have always been those of classic revivals—the Renaissance, the Louis XVI, and the Georgian. There are, happily, indications today of an American tendency to learn this lesson.

Thomas Harwick, the biographer of Sir William Cham-

bers, put this very succinctly in referring to Chambers' "Treatise on the Decorative Part of Civil Architecture." "The truths it inculcates," said he, "and the proportion and forms it recommends, the result of long experience and repeated observation of structures which have stood the test of centuries, cannot fail to impress upon every mind that there is a criterion of taste in architecture as well as in the other liberal arts—that genius is consistent with rules—and that novelty is not necessarily an improvement."

This "criterion of taste" the Renaissance designer possessed to a remarkable degree, considering his antecedents, and its application to the furniture he wrought is what made that furniture noteworthy,



REPRODUCTION OF A SIXTEENTH CENTURY DANTE CHAIR FROM THE DAVANZATI PALACE.

not only for that time but for all time, and hence worth reviving today. It is worthy of our painstaking study, that we may gain an inkling of those principles of form and decoration which governed him, and so help us to appreciate and to design good furniture in our day.

Long ago men learned that certain intervals in music, which compose the scale, and certain rhythms produce the most pleasing effects upon the human ear, and no modern composer, however great his genius, can afford to disregard the rules thus painfully learned. Just so no decorative designer can hope to succeed if he fails to comprehend and to feel those principles of proportion and arrangement of ornament which experience has shown to produce the most pleasing effect upon the eye. It was this feeling for proportion and design which guided the craftsmen of the Renaissance and which makes their work worth reviving, copying, and studying.

Symmetry, balance, and perfect proportion distinguished the best of the furniture of the Italian Renaissance. The sense of proportion, like an ear for music or an eye for color harmony, is a faculty partly inborn, partly cultivated. Proportion, like music, is governed by mathematical rules, yet in creative work it is a thing to be felt rather than taught and its manifestations are not easily described. The Renaissance craftsman felt it and manifested it and the proportions of his work are capable of setting up pleasurable reactions in those of us whose power of appreciation is alive to

that sort of thing. Study a fine piece of Renaissance furniture and you will observe that there is an intentional relation among the different dimensions.

Next to his sense of proportion the old Italian craftsman possessed an eye for design. He had an instinct for dividing his spaces in a manner calculated to produce the effect of grace and to embellish them with just the right amount and character of ornament. This ornament varied widely from the chaste to the lavish, but it was seldom stiff or crude on the one hand or overdone on the other.

I am speaking, of course, of the most representative pieces of the period, for not all Renaissance furniture was good. There were poor workmen in those days, as in ours, and designs were executed which lacked the merit which I have attributed to the period as a whole. That is why it is worth our while to cultivate our powers of selective discrimination.

Finally, the best Renaissance craftsmen, like true craftsmen of any period, were painstaking in their

work. The perfection of their workmanship, in construction, carving, and inlay, has seldom if ever been surpassed.

They took their work seriously, those Renaissance furniture makers. Cabinet-making became an honored craft; it was raised to the plane of an art. The furniture designer of the period was the peer of della Robbia and Brunelleschi, Palladio and da Vinci, Michael Angelo and Titian, Cellini and Ghiberti. The creative art impulse stirred in him, as in them, and



REPRODUCTION OF A SIXTEENTH CENTURY CHAIR, WITH CARVED COAT OF ARMS OF THE VITELLI FAMILY, FROM THE DAVANZATI PALACE.

his work deserves its place among the masterpieces of all time.

Carved woodwork became the vogue in interiors, and the furniture styles followed this lead. The furniture was nearly as architectural in type at first as that of the Gothic period, and followed architectural lines. Columns and pilasters were a feature. Cabinets and paneling took on the forms of temples and palaces, the fronts of cupboards and presses often representing temple façades. Then the furniture designers introduced new forms and a greater individuality. The furni-

fullest expression. In this matter of ornament, carving assumed the leading place, and some of it was masterly. The standard of workmanship was high. In type, it varied widely. Some of it was chastely classic, some architecturally stately, some voluptuously ornate. But in the best examples it was superbly executed, admirably placed, and calculated to ornament and not obscure the form. The cabinet-makers of the Italian Renaissance, with their impulse toward finely wrought carving, partially abandoned the coarse-grained oak, which was the



REPRODUCTION OF A SIXTEENTH CENTURY SIDE TABLE FROM THE DAVANZATI PALACE.
USED ORIGINALLY AS A WRITING TABLE.

ture became more movable and was less stiffly placed in the rooms.

The wealthy nobles of Florence, Milan, Rome, Venice, and other cities began to desire more sumptuous furnishings for their homes, and elaborate and handsome chests, cabinets, tables, chairs, beds, and other furniture were made for them. In general, the style of this furniture was palatial rather than domestic in character. Florence led in vivacious but dignified treatment of classic details. Sense of line and proportion were innate in the Florentine school, and even color was subordinated to form, though the wealth of ornamental detail was not to be suppressed. Venetian furniture was, if anything, even more richly elaborate.

Form was considered of primary importance, but it was in the ornamentation that the Renaissance spirit found its

commonest material of the Gothic period, and began using walnut, chestnut, and other woods.

The decorative styles lagged somewhat behind the architecture, and Gothic details persisted more or less until the true classic revival of the sixteenth century. The lives of the saints came to play a less prominent part in the carving, and the pagan element crept in. Mythological, allegorical, and historical subjects became popular, and that skillful combination of purely decorative scroll-work and pictorial form which we have come to associate with the Renaissance style. Centaurs and other human and animal forms were employed as part of an elaborate system of scrolls and acanthus ornamentation. Many of the details were of classic derivation and included the fret, the arabesque, the anthemion, the

acanthus, the scroll, the cartouche or pierced shield, and fanciful half-human forms. Much of the arrangement of these details was new at the time, not merely borders, cornices, pediments, and friezes, after the Greek manner, but variously arranged panels cleverly filled with delicate bas-relief work. Symmetry and balance were guiding principles in the arrangements. Then the carving became more and more intricate, in both high and low relief, and finally fantastic, un-

lions were used to enrich cabinets and caskets. Painting, gilding, and veneering were all employed, the carving on furniture being sometimes picked out with gold, producing a sumptuous effect. Some pieces were ornamented with stucco or covered with colored and gilded gesso.

During the sixteenth century the Italian metal workers were at the height of their powers, and coffer, chests, and other pieces of furniture were mounted



REPRODUCTION OF A SIXTEENTH CENTURY TABLE WITH CHARACTERISTIC LYRE-SHAPED END SUPPORTS.

til the baroque tendency became predominant and Italy handed over the scepter of furniture design to France.

Some of this Renaissance furniture was also enriched with inlay. Ivory and bone, sometimes engraved, let into ebony, walnut, and rosewood, had been popular for more than a century in Venice. Toward the end of the fourteenth century Italian cabinet-makers began copying marble mosaics by means of inlays of natural and dyed woods, scorched and etched with hot sand and iron, and polished with oils. This form of inlay, at first a specialty of the Certosan monks, was called *intarsia*. All sorts of designs were wrought in this medium, at first geometrical and floral in type, and later elaborately pictorial. Remarkable skill in workmanship was displayed. Some of the patterns were picked out with ivory and mother-of-pearl and lined with metal threads. Ivory was also carved and applied in bas-relief or inlaid in elaborate arabesques. Tortoise-shell, brass, mother-of-pearl, and even silver medal-

with wonderfully wrought steel, iron, brass, and bronze. In the same century *pietra-dura* became the fashion—an inlay of highly polished agates, rare marbles, hard pebbles, lapis-lazuli, and other stones.

It would be instructive, of course, to enumerate and describe the various forms and types of furniture produced during this period, but that sort of information is to be found in any good book on furniture. My purpose is not to present a catalogue of Italian Renaissance furniture, but rather to treat the subject critically and appreciatively.

If approached in the proper way, an examination of the examples of Italian Renaissance furniture in one of our large museums, at one of the occasional auction sales of antiques, or in the form of the sort of accurate reproductions to which I have referred, should give the studious person an understanding of its faults and merits.

Take, for example, the cabinet, which was one of the most important pieces of

furniture in the homes of the period, and one of the most imposing. It was always a thing of dignity. Large, sometimes monumental in their proportions, and richly carved or inlaid, these cabinets often displayed great magnificence and artistic skill. They were decidedly architectural in form, sometimes being designed with the steps and columns of a temple. Their chief charm lies in the perfection of their proportions and in the beauty of the ornament. At first they were a bit stiff and overwhelming, but those of the sixteenth century exhibit considerable grace and variety. Toward the end of the period they became over-elaborate and even bizarre.

Of the chairs, not all are worthy of equal commendation. The conventional forms of high-backed chair, usually with horizontal carved slats in the back, were often stiff but stately, handsome in their carving, with flat, square seats and arms. They lack something of grace and could scarcely have been considered comfortable. At the best they are examples of splendid workmanship; at the worst they are little more than commonplace in the matter of design. It is the *curule* form, often referred to by dealers as the *Savonarola* or *Dante chair*, which recommends itself to us more strongly because of its beauty of line. It was a smaller, more comfortable chair, fashioned on the Roman model in the form of a curved X, and was frequently constructed as a folding chair. Its curves are graceful, its proportions pleasing, and it displays a genuine feeling for design as applied to usefulness. Of the stiff-backed *Mansi* or *anteroom chair*, usually standing on console supports that look as though they belonged to a table, I can say little that is complimentary. It was a product of the late Renaissance and was neither comfortable nor graceful. Its chief interest is historic; as a contribution to the furniture styles of the period I cannot think that it did its originators especial credit.

Of the tables, the best have happily survived. The typical form is oblong, supported at the ends by solid carved and shaped supports or consoles, often terminating in large claw or scroll feet,

and usually connected by a heavy stretcher or lower shelf, upon which smaller supports sometimes rest in the form of an arcade. This form is pretentious but successful, the proportions being irreproachable and the whole well adapted to use. It is massive but graceful, the ornamentation being applied with a fine calculation for effect.

Some of the finest work of the period is to be found in the coffer and chests, particularly the *cassoni* or marriage chests. They are of various forms, having both curved and vertical outlines in the sides and ends, but nearly always exquisitely proportioned and ornamented. Some are carved with scrolls and figures; others are painted and gilded, or ornamented with intarsia and fine gesso work. Often they are masterpieces of workmanship. To a limited extent the same comments may be applied to the higher, narrower form called the *bahut*.

Existing examples of the beds of the period are rare. Though heavy according to our modern point of view, they were lighter and better than anything that had gone before. Well designed columns supported a canopy of wood, brocade, or tapestry, and the effect was stately and often graceful.

Elaborately carved buffets and credences often display the finest workmanship and the most delightful lines. Later forms, though they added greater variety to the home furnishings, were generally less admirable in their workmanship—serving tables and sideboards, chests of drawers and dressers for the bedroom, couches, bookcases, and writing tables or desks. Mirrors, wall brackets, screens, and other miscellaneous objects were as often bad as good in design.

In short, the student of Italian Renaissance furniture must approach his subject with a discriminating eye. In some of the chairs, tables, cabinets, and chests he will find forms and ornamentation that have never been surpassed in any age. And when it is remembered that these craftsmen of the Renaissance were hewing new paths, were pioneers in their craft, the homage of posterity must be accorded them.



TWICE TOLD TALES

DECORATIVE TEXTILES,* by George Leland Hunter, is practically a reprint of articles on various subjects which appeared recently in a magazine devoted to the furnishing trades. Many excellent and scholarly publications have been issued under similar circumstances; needless to say, in such cases the book was the original objective in the author's plan, and the magazine articles the secondary one; in Mr. Hunter's case there is little doubt that this essential condition is reversed.

Subjects arranged for monthly digestion by a mixed public must necessarily be built on pseudo "popular" lines; the statement made by the author in the preface that "it will be found invaluable not only to those who study and teach in schools and colleges, but also to those who read for personal culture and domestic practice," removes the suspicion of any attempt on his part to scale the rugged heights of scholarship.

The text is a compilation and condensation of easily accessible facts, taken

from standard works; no effort has apparently been made to gather new evidence from the abundant and untouched material existing in forgotten and unsuspected quarters, which the "flair" of the scholar unearths to the delight of the reader, who thereby enjoys the exhilarating sensation proceeding from contact with that which is rare.

With truly Elizabethan humor, the author advises us that "the main text of my book is of course Texture"; that is naturally a great disappointment to all who, attracted by the title, expect enlightenment regarding the decorative element in textiles, compared with which texture is secondary and subordinate, and concerns the mechanic rather than the designer.

The book is lavishly illustrated with innumerable half-tones and twenty-seven fine color-plates, the majority of which we recognize as old acquaintances. These cover an enormous range in time, country and subject, with the inevitable disadvantage that in few instances are there sufficient examples of a period or style to give any latitude of choice to a designer seeking data for a specific purpose.

Assuming that practical utility figured in the argument for this volume's existence, it is to be regretted that additional examples were not added to those origin-

**Decorative Textiles*, by George Leland Hunter. An illustrative book on coverings for furniture, walls and floors, including damasks, brocades and velvets, tapestries, laces, embroideries, chintzes, cretonnes, drapery and furniture trimmings, wall paper, carpets and rugs, tooled and illuminated leathers. With 580 illustrations, 27 plates in color. 9½x12¾ in. Printed by the Dean-Hicks Co. at the Good Furniture Magazine Press, Grand Rapids, Mich. Philadelphia and London: J. B. Lippincott Co. \$15 net.

ally selected for the magazine articles, amplifying those types of ancient manufacture which daily provide stimulation to industrial activity of the most commendable order; these might have replaced the chapters on wall-paper and leather, which, in spite of the author's excuse for their inclusion, can only be regarded as "padding" in a volume on textiles. As a whole, this work is an excellent scrapbook of varied patterns, which should prove stimulating to those who digress with open minds, inviting chance inspiration.

Modern civilization is rapidly evolving a novel system of development, which consists in the segregation of its component activities; consequently, digressions of a heterogeneous nature are obstructions to progress rather than contributions. An accumulation of well-known facts and elementary knowledge, such as has been culled by Mr. Hunter, has its place in a magazine article, but one hardly expects to encounter such material in a pretentious tome. Data are credentials presented in justification of a deduction, an analysis, or a theory formulated; their presentation unaccompanied by any of these is an equivalent to an assortment of numerals in lieu of a subtle calculation. An old tale is doubly excused if it elucidates an intricate point, but antiquity has its limitation as a recommendation.

As the text presents no novel aspect, we acknowledge our obligation to some of the illustrations, which enlighten us as to the enormous progress made by American weavers in the field of decorative discrimination. These men have made a handsome response to the growing demand for purity in style and technical accuracy, which has existed in recent years, due to the great strides made in American domestic architecture and decoration.

This demand dates from the moment when producers realized that certain decorative treatment possessed the power to create a considerable appreciation in the value of material, and that decorative merit was not an indeterminate quantity, but one gauged by rigidly fixed standards.

So these textile manufacturers approached the intricate subject of decoration with the same logical process of argument as is practiced in determining a course of policy; mastery of all needful technicalities was the preliminary step, regarded as a phase of equipment. The utilization of this technical resource in the field of decoration was a tremendous problem, as the professional designers were too few in number and insufficiently trained for the great work.

With sound common sense, the safe road to experience in decorative interpretation was seen to lie in making exact reproductions of the masterpieces of the weaver's art, in which the accomplishment of the designer wrought beauty from technical ingenuity. The modern weaves of ancient design reproduced in numbers in this volume convince us that when the American designer has attained the same proficiency and excellence in his work as the American manufacturer has we shall witness the dawn of an era for decorative textiles which will rank high in the world's history of applied arts; it is to be hoped that the energy now directed towards practical art education may adjust the disparity in skill existing at present between manufacturer and designer.

The term "Decorative Textiles" is fraught with enormous significance, and should have cast broad lights to illumine the way of an earnest body of men seeking guidance. These men, representing vast interests and great markets, now know that there is a virility in art capable of generating great commercial activity; they would harness that power through acquaintance with the standards whereby its works are judged, the signs that denote its presence, and the impulse from which it proceeds; for such men, a mere itemized list of the details depicted in pattern does not serve—the subject of decorative textiles cannot be rated so lightly.

The publishers are to be complimented on the manner in which this book has been printed and edited; it is a handsome specimen of typography.

L. V. S.



**Recent Develop-
ments in the In-
dustrial and
Decorative Arts.**

There has been, in America, a remarkable quickening of popular education in all its branches. In none of these has progress been more notable than in the development of a historical background for the appreciation of the principles of good art. An immediate opportunity for the exercise of such appreciation lies in the realm of industrial art, whose means and methods are applied to the objective surroundings of daily life.

With a success which cannot be questioned a continuous effort has been made for years, through schools, museums and current publications, to raise the standard of taste of the consuming section of the public. The next step would naturally be to assist the producer in his task of supplying the resulting discriminating demand.

The world war gave a tremendous impetus to the situation by crystallizing the patriotic determination to make domestic products equal to those from abroad, whose usual channels of import had been restricted or obstructed. When once the manufacturer was convinced that a high standard of design and craftsmanship forms an unassailable business asset, the battle may be said to have been won. This past year presents many evidences of results obtained as well as of new efforts being made by the various branches of the educational system.

Perhaps the most striking testimony to the success of the campaign for the education of taste lies in the recent organization of the National Association of Decorative Arts and Industries, which aims to include the large number of existing asso-

ciations allied with the industrial arts. In this federation the producer and the consumer meet and share the high aim of the united group; for not only are the great manufacturers included, but the consumer, whether interested individual or decorator, the distributor of manufactured products, whether wholesaler or retailer, and the great educational influences of the publishers, schools, art museums, libraries and women's clubs, are all found within its membership. Through the agency of these various groups the National Association of Decorative Arts and Industries should be able to exert a marked influence upon the home environment of the nation, an influence whose ultimate aim is the creation of ideals which, arising from constant response to stimuli intellectual and aesthetic, make for increased happiness and development of character.

The war, in emphasizing our former dependence upon European designers, has led us to take stock of our own lack of opportunities for training our people in this line. In direct response to this need is the establishment of certain new courses at Columbia University in the Department of Extension Teaching. These courses in Decorative Design, open to both men and women, are modeled upon the method of Beaux Arts teaching of architectural design, which has proved the best system in practice thus far. The problems and sketches of the courses are issued and criticised at stated times, and are judged by a jury of qualified practitioners. The work is, of course, competitive; and the three courses offered in elementary, intermediate and advanced design correspond approximately to Class B problems (elements and projects) and Class A projects of the Beaux Arts Institute of Design.

Next in importance to the training schools for the designers of the future is the duty of the possessors of art collections to render these available to manufacturers and designers for the purposes of study and inspiration. The creation of a new Department of Industrial Art at the Metropolitan Museum of Art cannot but fill a most essential position in the general scheme outlined above. This department will form a clearing house for ideas of use in the industrial arts. The members of the department are at the service of manufacturers, decorators and architects to facilitate their access to the store of material deposited in the Museum. The large collection of fine examples of furniture-making of the past may be measured, drawn and used as the basis of new designs, as well as the collection of textiles with its representative weaves from the earliest times to the present day. The hundreds of photographs and lantern slides and the finely selected books of the library will be chosen to suit individual needs. Seminars are regularly held for the discussion of problems currently confronting trades people and designers, and the close relation which the new department will maintain, both to the current trends of industrial design and to the material which lies ready to serve as inspiration for present-day needs, will prove of constantly increasing usefulness.

In the last exhibition of the Architectural League of New York, there was noticeable a much increased emphasis upon domestic products in industrial art. This is in line with the interest which the League is showing in its discussion of the problems common to architects and manufacturers, and the League exhibitions will be one of the most potent factors in the educational campaign of publicity in behalf of better American manufactures.

The position of American architects in the past has been open to the objection that their realization of the country's failure to produce objects for general household use of a high quality of design and craftsmanship has usually been expressed in a mere carping criticism. Now comes the opportunity for positive action by the requisitioning of American made furniture, textiles, wall papers and ceramics wherever these reach a certain standard of excellence and by a frank and open condemnation of such of those as do not attain a desirable standard of utility and beauty.

CHARLES OVER CORNLIUS.

The Personality of the Entrance Gate.

The initial approach to the country estate or the summer home should be in harmony with the atmosphere of the place to which it offers access. It should be something more than a mere architectural ornament mounting a name plate. Like an outstretched hand of greeting, from which radiates the personality of a welcoming host, the entrance gate should hold some definite suggestion of the character of the environment to which it opens the way. The name of the country place, if it has been well chosen, is often of assistance in conveying this desired impression. But even the most appropriate name must be given a proper setting to make it effective as an aid to proper introduction. To this end art may be summoned to one's assistance, for art is ever ready to lend help in the way of giving expression to such an illusive and intangible thing as "atmosphere." After art has spoken, her idea may be wrought out through a variety of structural mediums.

As an example of the effective and pleasing introduction which an entrance way may hold for those who have occasion to pass through it may be cited by the simple though artistic concrete posts and the attractive gates pictured herewith which mark the approach to the House in the Woods. Not only are the lines of the concrete in keeping with their surroundings, but the tangle of wildwood and the leafy drive are so in harmony with all that the name suggests that nothing is left to be desired in the way of a fitting introduction to this summer home. Before one has come upon it the mind has visioned a habitation sequestered amid a natural woodland that shelters native birds and small denizens of the forest. This entrance speaks of simplicity and of an atmosphere in which one can draw close to nature in her varying moods.

The entrance of Wadsworth Hall speaks of other things. This approach is well designed, attractive and fairly simple in comparison with many others. There is about it much of the same dignity and stateliness which the name, from its English borrowings, implies. The glimpse through the open gate suggests stretches of closely cropped lawns and an abundance of carefully tended shrubbery. One knows full well that the landscape gardener has been called upon to do his utmost and that the touch of his genius has been added to what



HOUSE IN THE WOODS, LAKE GENEVA, WIS.



RIVERBANK, GENEVA, ILL.



WADSWORTH HALL, LAKE GENEVA, WIS.



ESTATE OF MR. JOHN ROBERTS, BARRINGTON, ILL.



ESTATE OF THE LATE J. H. MOORE, LAKE GENEVA, WIS.



GREEN GABLES, LAKE GENEVA, WIS.

nature already has supplied with lavish hand. However, one would not expect to get so near to nature on the grounds about Wadsworth Hall as one would in those surrounding the House in the Woods. This entrance leads one to expect a somewhat formal type of gardening such as is found often in public parks and cemeteries. Indeed, the rather funereal cast of the top stones of the pillars lends a somber touch to what otherwise is splendidly in keeping with the dignified atmosphere of the place. However, one cannot repress a thought as to how out of place this entrance would be as an approach to the House in the Woods and how lacking in harmony the other would be as a means of introduction to Wadsworth Hall.

Before the pergola entrance to Green Gables one must needs pause to draw a long breath. In conception it borders on the ornate, if not, indeed, upon the elaborate; yet its story is straightforward and to the point. It speaks of a place where embellishment is the rule and where simplicity receives scant consideration. And this, in truth, is the keynote of all that one finds, just as it is the chief feature of the entrance in question. In this entrance the liberal use of vines and foliage constitute its real effectiveness. Without them, one would find the lines harsh and lacking in appeal. As it is, the vines are just enough but not too much to mask the angular effect of the concrete. Plants spring from unsuspected footholds and blossoms add their colorings to the green of the paneled name plates and the rafters overhead. The art glass of the decorative lamps adds its bit also to the color scheme. The anticipations aroused by this entrance do not fail of fulfilment as one passes on into the estate. Scarcely fifty rods beyond, one spies a little structure of bungalow design,

with art glass windows and an oak door bearing a burnished knob.

"Nice little cottage!" one ventures to remark to a man operating a lawn mower. "For the help, I suppose?"

"That!" he replies, with a glance in its direction. "No. That's the chicken coop."

The entrance to Riverbank is so simple, despite its ornamental birds, that one might pass it by were it not for the story which it too has to tell. For one thing it will be noticed there are no gates attached to these massive concrete posts. Nor does one find any sign tucked away near by reminding one that these are "Private Grounds" or that "No Trespassing" is permitted. To the initiated this is significant. Riverbank is never closed to the public. Its many novel features are available for the enjoyment of everyone. These comprise a variety of things ranging from an old Dutch windmill, a Grecian swimming pool, wonderful flower gardens and a collection of birds and animals. Possibly the eagles with outstretched wings which greet one at the entrance are more indicative of what one finds than one might have suspected. Then, too, the name "Riverbank" introduces one to a quietly flowing stream a hundred yards away.

The utilization of the keeper's lodge as an entrance archway is not a common way of introducing one to a country place. Such an entrance, however, lends itself to splendid effects and no doubt possesses certain advantages. Beyond such an entrance one would expect to find not only an elaborate mansion but well appointed barns for blooded horseflesh and fancy, registered dairy cows. Farming de luxe can well be imagined to be the hobby of one who must needs drive through the side of a house to gain access to his broad acres.

ORIN CROOKER.

THE ARCHITECTURAL RECORD

FEBRUARY 1919



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Bishopric Board Makes Stucco Finish Popular

When a scientifically constructed background for Stucco was discovered—a background that would clinch the stucco so it couldn't crack or flake off—then the stucco home led in public favor.

Bishopric Board was "discovered" six or eight years ago and Bishopric Board was the background used in the home of Mr. P. N. Leone at Hartford, Conn., illustrated above, and recommended by Architect R. F. Barker.

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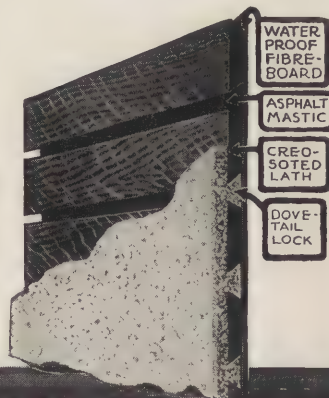
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THE ARCHITECTURAL RECORD



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THE CHAPEL. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



THE RESIDENCE OF MAJOR J. H. H. PESHINE

SANTA BARBARA, CALIFORNIA



MYRON HUNT, ARCHITECT

By CHARLES OVER CORNELIUS

IN this age and country of eclectic art, the occasions are all too rare in which we find modern structures so thoroughly supported by a combination of historical influences in their mode of esthetic expression as is the house of Major and Mrs. Peshine in Santa Barbara, Myron Hunt, architect. Here the opportunity of following out traditions of family and environment has been accepted with a subtle appreciation, and the resulting work gives expression to many of the elements which go to make up one of the three so-called architectural styles which America may justly call her own.

The Spanish Colonial architecture, whose abundant and exuberant expression forms such a wealth of beauty in Mexico, is in some respects of greater importance than the wooden architecture of the east-

ern coast of the United States, with its English or Dutch inspiration. The use of monumental material gives it an impressiveness consistent with the fabulous wealth of its innovators; its frank response to the demands of climatic circumstance, and its utilization of the aboriginal craftsmanship of the conquered people, all aid to define it as the amalgamation of an indigenous artistic cultivation with an imported architectural style. This is in contradistinction to the history of our English Colonial, which is a development of a style imported from abroad, whose transplanted evolution was continued along well established lines, uninfluenced by any indigenous art but responding to more external differences of taste and usage or the necessity of adaptation of local material.

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CHAPEL AND HILLSIDE BACK OF THE HOUSE. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA.
Myron Hunt, Architect.

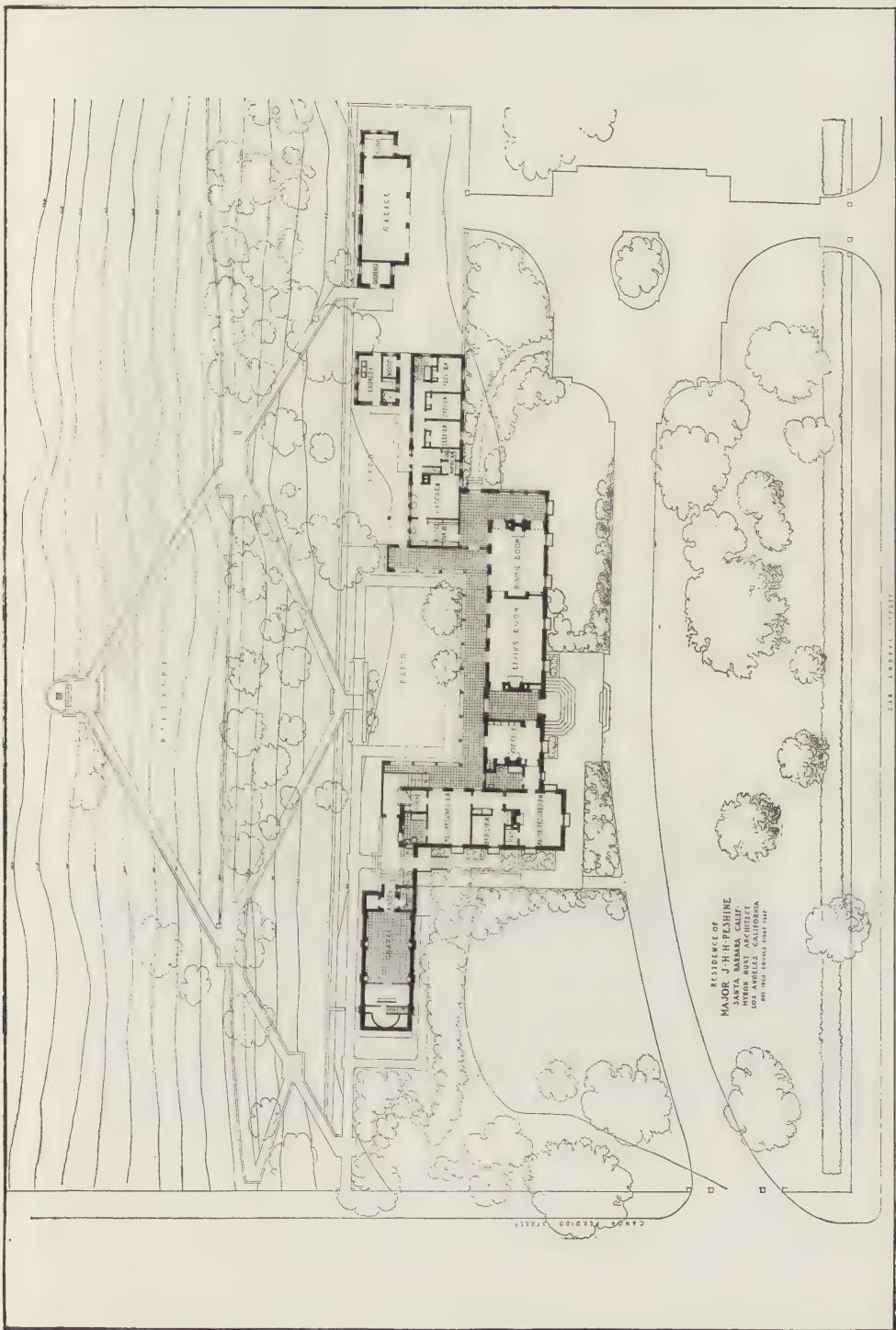
Direct descendant from the Spanish Colonial, the Mission architecture which the Jesuit fathers brought into California is more nearly akin in its simplicity to the earlier Colonial of the East; for the political, religious or domestic requirements in both cases were not such as to lead to sumptuous or elaborate building. It has the inestimable quality which results from the use of local material and craftsmanship, of planning to suit climatic and topographic conditions and of unaffected response to utilitarian needs.

This house group in Santa Barbara is the confluence of the rich family tradition of Spanish-American nobility and of ever-strong Catholic faith, with their concomitant artistic expression fused in the crucible of a cosmopolitan but discriminating modern taste.

The location of the house is the unconscious *raison d'être* of the picturesqueness in line and grouping which characterizes

the exterior. Its low-lying length at the foot of the towering hillside is as inevitable in its contrast as are the tall spires and windmills of flat, monotonous Holland, or of the tower of Seville in its plain.

In its plan and elevation, the house proper falls into three units of usage, whose treatment in relation to one another is flexible and sure. The two-story block contains the bedrooms for family and guests, with baths and dressing rooms; in the long central portion are the more formal rooms—entrance hall, office, living room and dining room; while the service wing occupies the remainder of the group. The dwelling forms three sides of a patio, around which runs an open loggia; and the requisite seclusion and inclosure of a fourth side is supplied by the hillside, covered with virgin scrub, which raises its five hundred feet from the back of the quadrangle. The planting



PLAN OF GROUNDS AND RESIDENCE OF
 MAJOR J. H. PESHINE, SANTA BARBARA,
 CALIFORNIA. MYRON HUNT, ARCHITECT.



GENERAL VIEW. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.

of the patio is purposely simple, and the spirit of the place will find its expression as the naturally worn paths spring up and occasional planting supplements the old trees and shrubs about which the house it built.

The dominating mass of the chapel is fittingly at the highest level, and from its elevation guards the lower units of the house and dependencies which stretch away to the west. There is approach to it equally from the street, the house and the garden; and in its embodiment of an undying religious devotion this accessibility to the many as well as to a few is of pleasing significance. This little house of worship, with its low-pitched roof, shallow buttresses and angelus belfry, has the solid and enduring structure of the early Mission chapels. The interior is correctly appointed from the font room to the altar, with the offices for the priest in the high basement story. The tunnel vault of the ceiling forms intersections with the window vaulting, and the three bays into which the room is divided are marked by broad arches flatly treated. The plastered walls and vaulting form a perfect setting for the richness of the woodwork, the wrought iron and the altar hangings, with their harmonious colorings, that play their appointed part in this union of the arts for the highest purpose to which they can be dedicated, the inspiration of religious devotion.

Aside from the more general aspect of the house, its picturesqueness of grouping and comely proportions, perhaps the most striking feature of the exterior is the spotting of the decoration in the spirit of its architectural ancestors. This concentration of ornament owes its success to the sparkling and abrupt contrast which the richly decorated units of the design make with the plain wall surfaces surrounding them. These plain surfaces in their turn enhance the beauty of the ornament by acting as a frame to shut out the surrounding elements which tend to distract.

The only sculptured decoration of the façade occurs about the doorway of the entrance, which is enframed by an ap-

plied Ionic order with its delicate capitals, and surmounted by the helmet, mantled and crested, of the family arms. The second story of the bedroom wing is marked by flat pilaster strips resting upon an unmolded string course, which is carried across the lower connecting blocks of the house to mark a sort of frieze. The principal decorative note is struck by the beautiful wrought iron work of the door, lanterns, window grilles and balconies. The painting of the ironwork a soft Spanish green serves, in the case of the windows and doors, to lighten the blackness of the openings, while in no way lessening the contrast of the balconies and lanterns with the almost white walls. The mottled red, yellow and bronze colorings of the roofs are pleasantly contrasted by this painted green with the gentle greens of the olive trees and the deeper tones of the palmettos, the brilliant light fusing this array of contrasting color into one harmonious whole.

The patio, an outdoor living room, vaulted by the sky, is surrounded on three sides by the loggia, with its unadorned piers and bracket capitals, and forms the principal direct circulation for the building as a whole. The entrance hall runs through to this loggia, and a stairway leads from it to the tiny terrace before the chapel and to the guest rooms on the second floor. The imagination is stimulated by the pathways obliquing up the hillside and converging at the exedra fifty feet above.

The paved entrance hall is tall and vaulted, and its two arched doorways enframe the enchanting vista through the patio to the steps which lead up to join the hillside paths. It is from this entrance hall that the full beauty of the iron grilles of the doorway is appreciated, silhouetted as they are against the outside light.

The living room, spacious and well proportioned, opens from this hall. The ceiling of this room is of heavy beams supported upon wall brackets, the space between paneled, and the whole glowing with color and gold. The simple plaster wall surfaces form an ideal foil for so



FRONT ELEVATION. RESIDENCE OF MAJOR J. H. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



ENTRANCE DOORWAY. RESIDENCE OF MAJOR J. H. PESHINE,
SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



HOUSE AND GATEWAY LEADING TO CHAPEL.
RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



CHAPEL. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



CHAPEL, WITH A GLIMPSE OF THE PATIO BEYOND.
RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA
BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



SECOND STORY WING OF MAIN HOUSE AND PART OF THE CHAPEL, VIEWED FROM THE HILLSIDE. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



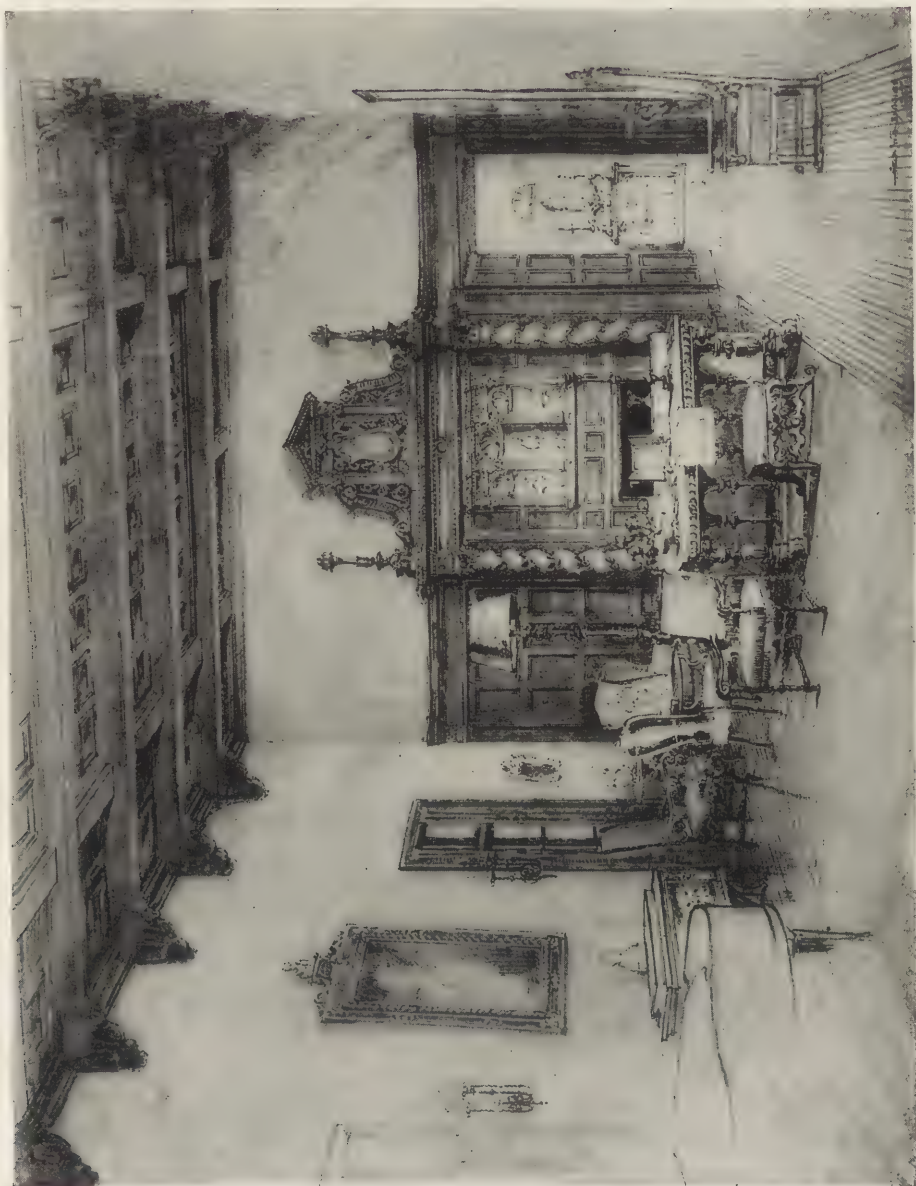
CORNER OF THE PATIO SHOWING ANCIENT OLIVE TREES ABOUT WHICH THE HOUSE HAS BEEN BUILT. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



MAIN STAIRWAY TO SECOND STORY. RESIDENCE
OF MAJOR J. H. PESHINE, SANTA BARBARA,
CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR CHAPEL INTERIOR. RESIDENCE
OF MAJOR J. H. H. PESHINE, SANTA BARBARA,
CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR LIVING ROOM INTERIOR. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.



SKETCH FOR DINING ROOM INTERIOR. RESIDENCE OF MAJOR J. H. H. PESHINE, SANTA BARBARA, CALIFORNIA. MYRON HUNT, ARCHITECT.

much richness both in the ceiling and in the elaborately treated fireplace wall, which is paneled high with an adapted Hispanic motif in dark and carven walnut. The design of this paneling, while containing many elements of Spanish-American ornament, is yet a very restrained treatment, in which good taste and logic have controlled the exuberance of such traditional design. The long windows admit the direct light from one side and the subdued light of the patio from the other.

In the dining room the richly paneled ceiling is flatter and less heavy, yet beautifully designed and executed; while the sideboard alcove is a dignified balance to the fireplace to which it responds. The vista from here through the living room into the hallway is focused in the almost altar-like setting at its end, possibly a trifle too ecclesiastical in its suggestion.

The arrangement of the breakfast porch bespeaks the semi-tropical climate, and separates the service wing effectively from the rest of the house; while the garage beyond is well out of the way, and activities there can scarcely disturb the quiet of the living portions.

In the design of modern buildings, most of which follow traditional architectural forms, the choice of the form is often difficult of decision. The per-

sonal predilection of a client for a particular style, the methods of building in a given location, the climatic or topographic conditions may each urge in a different direction; and it is always a matter for regret when the opportunity is lost to build in a manner in conformation with the custom of the country evolved through generations of local craftsmanship, and equally a matter for congratulation when the reverse is true. In certain portions of the United States no such traditions exist; but in the cases of Southern California, of Florida or of the Atlantic seaboard to the north, a very strong precedent has been established which is disregarded only at a risk.

It is the recognition of this fact in the design of the Peshine residence, the yielding to the Spanish-American momentum of the locality, where the echo comes back in the names of towns, of rivers and of mountains, which gives it its genuine individuality and character. Such a susceptibility to the inherent qualities of a locality, particularly when they fit in with family tradition and personal taste, is of the utmost desirability in the development of domestic architecture, the form of the art in which lies the possibility of this country's greatest contribution to the architecture of the world.

WAR MEMORIALS



By Ralph Adams Cram

THE impulse towards the erection of war memorials is instinctive and right; the deterrent lies in the fact that the whole world seems to have pretty much lost the ability to carry out its intentions after an acceptable fashion. The varied catastrophes that followed the Civil War are still vividly in mind and often conspicuously in the eye. If we are to see a new crop of granite columns braced by cast-iron goddesses; of smirking generals on bronze race horses; of miniature triumphal arches and tin soldiers, then the tragedy of the war will remain with us beyond its allotted time.

Just at present there seems to be a sort of concerted movement towards giving the proposed monuments a super-practical character—cleaning up slums, building model tenements, creating civic centers and the like.

Here again there is something good in the impulse, but it is apt to savor of shrewdness. Cleaning up slums is the duty of each community that possesses such institutions; and the idea of avoiding municipal responsibility by linking a neglected obligation with a patriotic impulse, of getting the thing done on sentiment rather than as a measure of justice, is not altogether appealing. Let these reforms be carried out by all means, and associated if necessary with the names of the dead and the victory they helped attain; but add, as always in history, some one visible monument that is marked by its beauty and impressiveness—and has therefore the highest value.

This does not mean the standard type of "monument" or statue, for there are many other possible forms. A bridge may be more beautiful and inspiring, even though the tendency has been of late in

exactly the opposite direction. For cities on the seaboard or the Great Lakes and rivers a boat landing may be made extraordinarily effective, with its marble steps, balustrades, masts, lanterns and statues. The American water-front is the most barbarous exhibit we have to offer, and a space of decency would be a relief. Fountains are in Europe amongst the most beautiful objects of art; with us they are few in number, generally ugly, and frequently dry. A triumphal arch, well designed, of sufficient size and impressively placed (an inconspicuous site between twenty-story office buildings does not fill the bill), still remains one of the most novel of memorials for communities that can meet the great expense. For small towns, a really fine flag-staff with a monumental base is as good a monument as one could ask.

Of course, the best and most significant memorial is the votive church; but what is the use of talking of this now when half the people are inimical or indifferent to formal religion, and those that remain over are divided amongst fifty-seven varieties of sects and would be prepared to fight to the death over the question whether the votive church should be administered by the Seventh-Day Baptists, the Plymouth Brethren, the Reformed Episcopalians or the Christian Scientists. There are, at times such as this, drawbacks in too complete "freedom of conscience."

No, the monuments must be secular; but if they are to exist at all, they must be the best. This means that we are bound to guard ourselves scrupulously against the commercial purveyors of mortuary art. What has happened in cemeteries in the way of family vaults, "Celtic crosses," symbolical statues and headstones, should give us pause. There

are just two people who can possibly produce what is wanted, the architect and the sculptor; and the committee that picks its type memorial from an illustrated catalogue (probably delivered by parcel-post) gets exactly what it deserves, even if the soldiers and sailors and airmen get much less. I am not sure but that it would be a good idea for the American Institute of Architects to approach the sculptors of the country with the idea of forming a committee that should put forward typical designs for possible memorials.

After all, what we do should be far more than local or even American in scope. The victory is over the enemies not alone of America, but of the world, and our allies have suffered and accomplished more than we. Should not then our own memorials take some cognizance

of what Great Britain and France and Belgium and Italy have done, and what they have endured? I am not very fond of replicas, but I sometimes think the best thing we could do would be to re-create in all the cities and towns of the United States some one of the destroyed monuments of France or Belgium or Italy. I do not mean Rheims Cathedral (though what a great idea that would be!) or the Cloth Hall of Ypres, but some chapel or château or bridge that should stand always as an example of what the universal enemy destroyed when he could get the chance, and as an evidence of what our men went abroad to save, and did save—the fine spirit of true civilization that showed itself once in art such as this, and has been preserved, that it may show itself again.

HOUSING PROJECT SCHEDULES



By N Montgomery Woods

A HOUSING project, or in fact any operation involving a considerable number of buildings, of many designs and sizes, and of varying combinations of materials, may become the source of endless confusion and bewilderment unless the plans are accompanied by some sort of a schedule sheet which will furnish as far as possible the information that will be required by all of those who may be interested. This will include the owners, and those who may assist in the financing; the designers, both architectural and engineering; the estimators of materials and costs; the builders, superintendents, foremen and workmen who engage in its construction; and, finally, the agents in charge of the rental or sale of the finished property.

Those of us who have had the experience of being handed a roll of blue prints of fifty pounds or more, representing some large number of houses (just how many was not stated); of certain varying types (the nature of which had to be gathered by looking over a hundred or more sheets); and located on a large tract of land on various blocks and lots (neither of which were numbered), will thoroughly appreciate the value of having someone place everything we need to know on the top sheet of the set of plans, so that without turning a page we may find a detailed statement or a brief summary, whichever we may wish, of just what the whole thing is about.

It is all so plain to those who have laid out the scheme that they are apt to overlook the fact that anyone unfamiliar with the particular project may find it necessary to ask scores of questions, which might be easily answered by the architects if they were present, or which may be figured out from the plans if some hours are spent in going over them; but which, in any event, will involve much waste of time and effort

Also some system should be adopted by which it may be readily ascertained whether or not the set of drawings given you is complete, and whether or not some one or more of the sheets have been abandoned or superseded. Hardly any building proposition ever goes through to completion without some alteration in the plans being made, and it is an imposition on anyone to allow him to spend his time upon a set of plans which he afterward learns are incomplete or out of date.

Such a need being apparent, the form illustrated herewith was prepared by the writer during the past summer, and has been adopted and used by the United States Shipping Board Emergency Fleet Corporation on all of their subsequent projects, and for revised schedules on all of their previous ones.

To use any form, some system of notation must be adopted, and the one determined upon for use in the schedules referred to may be described as follows:

First, regarding the indexing of drawings, the schedule sheet is No. 1, and is placed on top of the set, all sheets of which are made the same size, if possible. In the lower right hand corner of each sheet is its number, in very prominent type, so as to require no effort to locate it. Then, on the schedule sheet, is an "Index of Drawings," in which is given a complete list of all drawings for the project, of every kind and description, even though some of them may have been superseded or abandoned. If such is the case, list them anyway, and make a note to that effect, so that even though someone may have such a sheet he will waste no time on it.

This schedule sheet is dated, as are all the other drawings, and on the index at the bottom of the list of drawings, a space is left for listing any subsequent drawings. These are to be added to the

schedule as they are completed, and new prints of the schedule sheet made and sent to all those interested.

In order to determine just what information should be supplied on the schedule sheet, we must first place ourselves in the position of the various interests who may be likely to require such information, and endeavor to arrange our sheet so as to place just in front of each inquirer the concise answers to his various questions. This brings up the questions, who will be interested in knowing these many things regarding the project, and just what information will they be likely to require?

These may be given as follows:

(1) Assuming that the project is financed by the Government, as has been the case in most of the recent instances, the department heads having charge of the financing and the general management of the operations will at times wish to obtain general information, such as the total number of house units, the number of groups, and the proportion of 4, 5, 6 and 7 room units; the number of unit types and the number of group types; the number of detached house units, of semi-detached house units, and the number of rows of 3, 4, 5, etc. This may be all they want to know at the time, so it seems advisable to give a brief summary in a separate rectangle on the sheet, in order that this information may be readily found without having to study the whole sheet. This has therefore been shown at the bottom of the sheet in the center, where similar information regarding any apartments or other buildings contained in the project is also to be found.

(2) The project supervisor, town planner, contractors, building foremen, etc., will want to know many things in addition to the above, such as the exact location of a given unit on the map, its position in a group, right or left hand, its variation of materials, the number of times it occurs in the block and in the entire project; the number of rooms it contains, its area and cubage; and the exact difference between its design and construction and those of some other type closely resembling it.

(3) The estimator who figures the quantities of materials and labor necessary to erect the houses must ascertain first the number of basic types of house units involved, and the architect should advise him just what these basic types are, and also regarding all the minor variations of each; listing in a separate column each type of house unit which is unlike the others, regardless of how trivial may be the difference. This being done, the estimator may proceed to do his figuring with much less chance of error than where he has been forced to prepare his own schedule—something he must do before beginning his work, unless the architect has supplied all of the required information with accuracy and completeness.

(4) The real estate agent or others charged with the rental or sale of the finished houses will want to know the number of end houses and the number of interiors; the interior houses having of necessity much smaller yards and much less light and privacy, the rentals or sale price will be correspondingly lower. This department is also interested in knowing just what other buildings, such as stores, schools, etc., are included in the project, besides much of the other information mentioned above.

To lay out such a schedule, the procedure would be as follows:

The property is first divided into blocks, by which is meant areas bounded by streets; and these are numbered consecutively 1, 2, 3, etc. Then each block is divided into lots, numbered each by three figures, the first being that of the block number. For instance, in Block 6 the lots are numbered 601, 602, 603, etc., so that when a lot number is mentioned the block in which it comes is known at once.

The individual dwelling, to be occupied by one family, is called a house unit, whether it be a detached house, half of a semi-detached house, or one of the units composing a row of three or more. Much confusion has been caused by the use of the words "house" and "building," some taking them to mean, for instance in the case of a semi-detached house, one-half of the structure; while others have interpreted them to mean both units taken

together. Therefore, in order to avoid this chance for error, the term "group" has been adopted to mean a separate structure, whether it be a detached house, a pair of units built attached (a semi-detached house), or a row of three or more.

The unit types are classified, and each one listed in a separate column, regardless of how trivial may be their differences. The capital letters where used in connection with the houses denote the number of rooms contained in the house unit, as follows:

A=4 rooms, B=5 rooms, C=6 rooms, D=7 rooms, etc.

Where two or more house units occur, each containing the same number of rooms, but differing greatly in other respects, such differences are designated by adding the small letters, a, b, c, etc., and such units are called basic types. Then, where a basic type is used in two or more minor variations (such as, for instance, the changing of a porch from front to side), such differences are designated by adding the numerals 1, 2, 3, etc.; and at the head of each column where such variations are listed there is given a brief statement of the differences between these types and the basic type from which they are taken, for example, "Same as A1 except," etc. Thus "Ab2" designates a 4-room house unit, of the basic type "b," and of the particular variation "2." House units are usually used with the plan in some instances reversed, so that the columns in which each are listed are divided into two parts, right and left, abbreviated "R" and "L." Then, as a variety of material combinations are usually employed, the right and left hand columns are further divided into as many parts as there are material variations, and these are designated by the small letters at the end of the alphabet, x, y, z, etc., and a key given below to show their meaning.

The various combinations of units into "groups," whether groups of one unit or of two or more, are shown under the head of "Group Types," and are numbered in Roman numerals, I, II, III, etc., to avoid confusion with the individual group numbers, which are in Arabic

numerals, 1, 2, 3, etc. For instance, in Block I there are four groups, numbered 1, 2, 3, and 4. No. 1 is of Group Type IV, which is a group of three units, as follows: Ba1 L, Ba1 R, and Ca1 L.

At the bottom of the unit columns we find the total number of groups, number of units of each type, number of left and right hand of each type, and the number of each material combination of each type. Also the number of each basic type and its variations are added together so that, for example, in estimating the heating on the Ab1 house units, of which there are 14, if Ab2 differs from Ab1 only in that the porch is moved from front to side of the house, then the heating on Ab2 need not be figured, but Ab1 figures simply multiplied by 30, the number of Ab1 and Ab2 units combined.

Then is found the total number of 4, 5, and 6 room units and the total number of house units in the project. The area and cubage of each unit is given, the area and cubage of the total number of each type, and of the total number of house units in the entire project. Thus in a few minutes it is possible to obtain a fair estimate of the cost of the project by multiplying the total areas or cubages by the proper price per foot. As there are hardly two men who figure areas and cubages on precisely the same basis, a statement is given under the "Explanation" as to the exact manner in which these are taken.

In the columns where units are listed the sheet numbers on which the plans may be found are given, so that no time will be lost in locating any drawings required.

If a portion of the housing facilities are in the shape of Apartments, a corresponding list of questions may be asked; and the form shown herewith gives a satisfactory method of supplying the necessary information, which will probably be clear without explanation.

A general "Explanation" is given on the schedule sheet for the benefit of someone who may wonder why a system is used which is apparently somewhat complicated. The answer is that the number of items to be incorporated is large, and an ounce of "complication"

will save many pounds of confusion and error.

To utilize such a schedule successfully it is, of course, necessary to see that all of those engaged in the design of the project are working on the same basis, and are laying out and numbering the various items accordingly. Therefore, all drawings from beginning to end, including plot plan, block plans, as well as all architectural drawings, should bear the adopted notation.

Unfortunately a project is rarely ever definitely determined upon until it is practically completed. Therefore, it is extremely desirable to assume at all times that changes will be made. Accordingly extra columns and other spaces had best be allowed for when laying out the sheet, in order that additional blocks, lots, unit types, and group types may be added at any time, without necessitating the redrawing of the entire sheet.



GENERAL VIEW CHAPEL AND HOUSE—MAJOR J. H. H. PESHINE'S RESIDENCE, SANTA BARBARA, CALIFORNIA.

Myron Hunt, Architect.

(For additional illustrations of this house see leading article in this issue.)



COTTAGE GROUP IN THE LORDSHIP MANOR DEVELOPMENT, BRIDGEPORT HOUSING CORPORATION.

THE GOVERNMENT'S HOUSING AT BRIDGEPORT, CONNECTICUT



By Sylvester Baxter

THE undertakings of the United States Housing Corporation at Bridgeport, Connecticut, are typical of the general requirements of a great industrial city, fairly swamped by the demands for dwellings made by the workers who flocked in to meet the needs of manifold industries flooded with war-orders. Bridgeport, one of the great seats of war-industries, was well along in the hundred-thousand class in population years before the war began. The increase since the war has been so enormous that it would be difficult to estimate the city's present size.

Before our country entered the war the orders from the Allies for munitions had been so great that the managements of the various local industries found that the law of supply and demand could not be depended upon to meet the urgent need for housing. It was seen that without the accommodations required for a class of well paid and high-class workers, a high-grade force could not be depended upon; the workers would be essentially a

floating population, here to-day and there to-morrow, according to the attractions of the various industrial centres, all competing for help and doing their best to draw the best labor to themselves. The problem was mainly to get the skilled workers there and to keep them there.

Fortunately the ground had been well prepared for carrying on the work of meeting these needs, and only when the task proved beyond the capacity of private means did it become necessary for the Federal Government to undertake the work on a vast scale. The manufacturers themselves had set out to supply the demand for housing when it became evident that without collective action of some kind the situation was hopeless. John Nolen, of Boston, widely known as a town planner, had been commissioned to investigate the subject. His report, "More Homes for Bridgeport," was carefully considered by a special committee of the Bridgeport Chamber of Commerce. In consequence the Bridgeport Housing Company was incorporated,



FINISHED COTTAGE AT BRIDGEPORT, CONNECTICUT.

with a capital of one million dollars, and work on a large scale was promptly begun. Several sites in various sections of the city and its neighborhood were carefully prepared for development; both apartment-houses and group-houses were promptly built in substantial and model fashion, and 200 or more families were accommodated. Still more extensive activities were undertaken by a single great manufacturing corporation, the Remington Arms Company, providing for the housing of 700 families. Together with the housing-work of the Federal Government, the total expenditure for new industrial housing in Bridgeport since the beginning of the war will amount to about \$8,000,000. With a very few exceptions all of these homes are of brick, with roofing of slate or asbestos shingles.

When it became evident that private resources could barely begin to do what was necessary, the large-scale operations of the Federal Government, set on foot not many months after America had entered the war, were greatly facilitated by what the local housing projects had already accomplished. The organization for the more extensive operations to no

little extent already existed. Mr. R. Clipston Sturgis, the Boston architect, distinguished for notable public work of a monumental character—including that noble Greater Boston landmark, the Perkins Institution for the Blind at Watertown—as well as for domestic architecture of a peculiarly intimate charm, had been in charge of the work for the Bridgeport Housing Company from the start, and knowing the ground so thoroughly, he was the right man for the larger undertaking.

The industries of Bridgeport are scattered all through the city. Hence, unlike most other projects undertaken by the United States Housing Corporation, the Bridgeport work is not concentrated upon one compact area, forming a neighborhood or separate suburb by itself, but is divided into five different developments. This brings each development into the neighborhood of factories, so that the workers in no case are more than a few minutes' walk from their work and do not have to depend upon transit facilities. Another feature is that all general accommodations for community needs—schools, playgrounds, parks, shops, and amusements—are furnished

in the city at large, so that all the Housing Corporation's outlays are concentrated upon the housing pure and simple.

It should here be said that besides Mr. Sturgis, as chairman and architect, the committee of designers in charge of this Bridgeport project consists of Mr. Arthur A. Shurtleff, of Boston, as town-planner and Mr. Alfred H. Terry, of Bridgeport, as engineer. Mr. Shurtleff has to his credit one of the most extensive and comprehensive examples of town-planning in the history of the profession in this country—the important metropolitan plan for the development of Greater Boston, upon which was based in great part the notable report of the Metropolitan Improvements Commission of 1909.

II.

There are five of these separate tracts

in as many quarters of Bridgeport. They have the character of "town sites" or additions, within a city. They each comprise what has either been vacant land or parts of what have been more or less sparsely occupied residential sections. Two are comparatively small urban tracts; these have been given a compact treatment appropriate to the environment, covered with model apartment-houses that accommodate without congestion a large number of families. All the five tracts, with one exception, have certain attractive natural features in the way of trees or agreeable bits of landscape with picturesque ledges, which have been made the most of in the pleasingly, as well as economically, developed plans for the several properties.

Was it not Napoleon who, in conducting one of his great military operations,



A BACK YARD AT BRIDGEPORT, UNDER CULTIVATION.

The division fencing of wire netting is the general rule with the Housing Corporation.



THE BLACK ROCK DEVELOPMENT (URBAN AND APARTMENT HOUSE) OF THE U. S. HOUSING CORPORATION, BRIDGEPORT, LAYOUT FOR THE GROUP. This tract has groups of fine old trees; the plan was developed to secure the best advantage from this circumstance.



THE OLD MILL-GREEN DEVELOPMENT (SUB-URBAN) OF THE U. S. HOUSING CORPORATION, BRIDGEPORT. LAYOUT FOR THE GROUPS.

The design of this tract was largely governed by the existence of picturesque ledges, tree-groups and wild shrubbery. It was the aim to preserve these features to the best advantage.



THESE TWO PLATES SHOW TYPICAL SINGLE AND TWO-FAMILY HOUSES DESIGNED FOR THE OLD MILL-GREEN DEVELOPMENT.

changed the course of an important route to spare a tree? A like consideration has been shown in planning for this epochal class of government work; the lines of roads and the layout of house-groups being modified not for the sake of obtaining an arbitrary picturesqueness in effect, but primarily for sound economic reasons—sparing trees, groups of trees, ledges, and other desirable and valuable elements of beauty, instead of ruthlessly and expensively slashing and blasting a way through them for the sake of a grid-iron monotony—a procedure that has earned for too many engineering operations the name of “landscape butchery.”

III.

The two tracts of distinctively urban treatment are respectively the Black Rock development (Group No. 1) and the Connecticut Avenue development (Group No. 2.) These properties are occupied by apartment-houses of three stories

each, built of brick, relieved by cast stone sparingly used. The units are designed in groups, disposed in rows or courts, thus combining with economy in construction a pleasing variety in appearance. In case of the courts, the effect is not unlike that of a college quadrangle. In these apartments each unit is planned with two stairways; two families are accommodated on each of the three floors. The greater number of these apartments are designed with four rooms: kitchen, living room, two bed rooms and a bath. The others have either three rooms or five rooms—about an equal number of each class. The needs of families of varying sizes are thus well met. In all cases the living room is also available as a bed room, if need be. With such devices as folding beds or convertible lounges, the same room may easily serve as both living room and bed room.

The conveniences have been thought-

fully studied with a view to economical construction; a standardized plumbing scheme for all the apartments, for instance, makes possible an excellent installation at minimum cost. It should be said that both apartments and single or semi-detached dwellings in this Bridgeport project—with the exception of one development—are designed to meet the best demands of a class of highly skilled, and correspondingly well paid, mechanics, able to pay rentals of from \$20 to \$35 a month; a class that commonly appreciates the elements of good looks and domestic comfort in surroundings. Great care has therefore been taken to meet these requirements in a way that makes these developments—disposed as they are throughout a large New England industrial center—a model of their kind; an invaluable asset to the community, enhancing the beauty of the city and setting so high a standard of convenience, comfort and taste as inevitably to encourage a demand among working-people of this class that will hereafter not be easily satisfied with anything less than "something just as good" in the truest sense of the term. Such leaven can hardly fail to work. And what a contrast to the jerrybuilt wooden three-deckers and two-flatters, in which workers are so often deluded into investing their good savings, are these substantially handsome and dignified apartments and equally substantial individual dwellings, enduringly built, beautifully cosy and garden-embowered! The

attention given to these qualities is a great economic as well as esthetic factor. Improvements of this character greatly enhance surrounding property values and create for a municipality most welcome additions to its taxable resources. On the other hand, it is related of one of the largest of New England industrial cities that when an unoccupied tract was "improved" with wooden three-deckers, the result was such a depreciation in neighboring properties that the appraised values of that entire section were less than they had been before.

From the foregoing it may be seen how exceedingly worth while is the attention given to artistic aspects in developing these properties. One of these urban properties, the Black Rock development, has a fine group of trees. These, carefully preserved, will at the start greatly enhance the appearance of the architectural group that occupies the premises. The other urban property, the Connecticut avenue development, is without natural features of this sort and must wait for them to be provided before the design in its best intentions can be fully realized. In all the properties, both urban and suburban, due attention is paid to giving the buildings a pleasing setting of tastefully designed grounds, simple and economical to maintain, and making the best of existing natural features.

IV.

There are two suburban developments:



HOUSES DESIGNED FOR THE OLD MILL-GREEN DEVELOPMENT.



HOUSE FOR THE GRASSMERE (SUBURBAN) DEVELOPMENT.

the Grassmere tract is close to the line between Bridgeport and the neighboring town of Fairfield; and the Mill-Green is on the historic Boston Post Road, near the Remington and the U. M. C. works.

The general effect of both of these tracts is that of a "garden-city" development that resembles the English type, though in architecture it has a distinctively New England character. The charm of the Mill-Green development is augmented by its natural features; picturesquely varied surface-contours with rocky ledges clothed with wild growths and accented by many pine trees in clusters. The grouping of the buildings has been planned with regard to the preservation of these features and making the best use of them in the design. Both of these suburban developments are occupied by groups of single houses, double (semi-detached) houses, and two-family houses (one family below, the other above) on individual lots. All the houses are of brick with slate roofs, some a story and a half high and others two stories. There are four to six rooms in each unit. These organic differences bring into play a diversity of types that give opportunity for much freedom of treatment and composition in the groupings of different

shapes and sizes. Every family is provided with its own plot of land, whether living in a single, double or two-family dwelling. The ways in which the requirements in this particular are met, by designing the layout of the land according to the house-plan, are admirable. In each case there is a small front yard with hedges and with shrubbery enough to leave a minimum of lawn-space to be kept in order; then there is a paved service-yard, so planned as to give room for a garage; and thirdly, a space for a house-garden.

In general these two suburban developments are along lines already followed in the work done by the Bridgeport Housing Company. Last summer, in the developments completed for that company, many of these gardens were filled with vegetables and fruit. It should be noted that the Bridgeport Housing Company was formed to meet the housing demands created by the war. The interests that organized it represent a large proportion of the establishments engaged in war work and correspondingly interested in the welfare of their employees.

The aspect of these developments is that of a residential section occupied by prosperous and well informed middle-

BRIDGEPORT - CONNECTICUT GENERAL PLAN FOR CITY CENTER

DESIGNED BY
J. H. WATSON
ARCHITECT
100 N. 10TH ST.
PHILADELPHIA, PA.



THE
CITY
OF
BRIDGEPORT



TYPICAL STREET PERSPECTIVE. CRANE DEVELOPMENT, BRIDGEPORT.

on account of topographical conditions, such as contours and desirable natural features well worth preserving. This irregularity in plan accommodates movement with greater directness than would a conventional rectangular layout. There is also a "cemetery extension" of this property: a level tract with a rectangular plan, the streets dividing it into four blocks. The plan of the level Grassmere tract, near the Fairfield line, is divided into seven rectangular blocks.

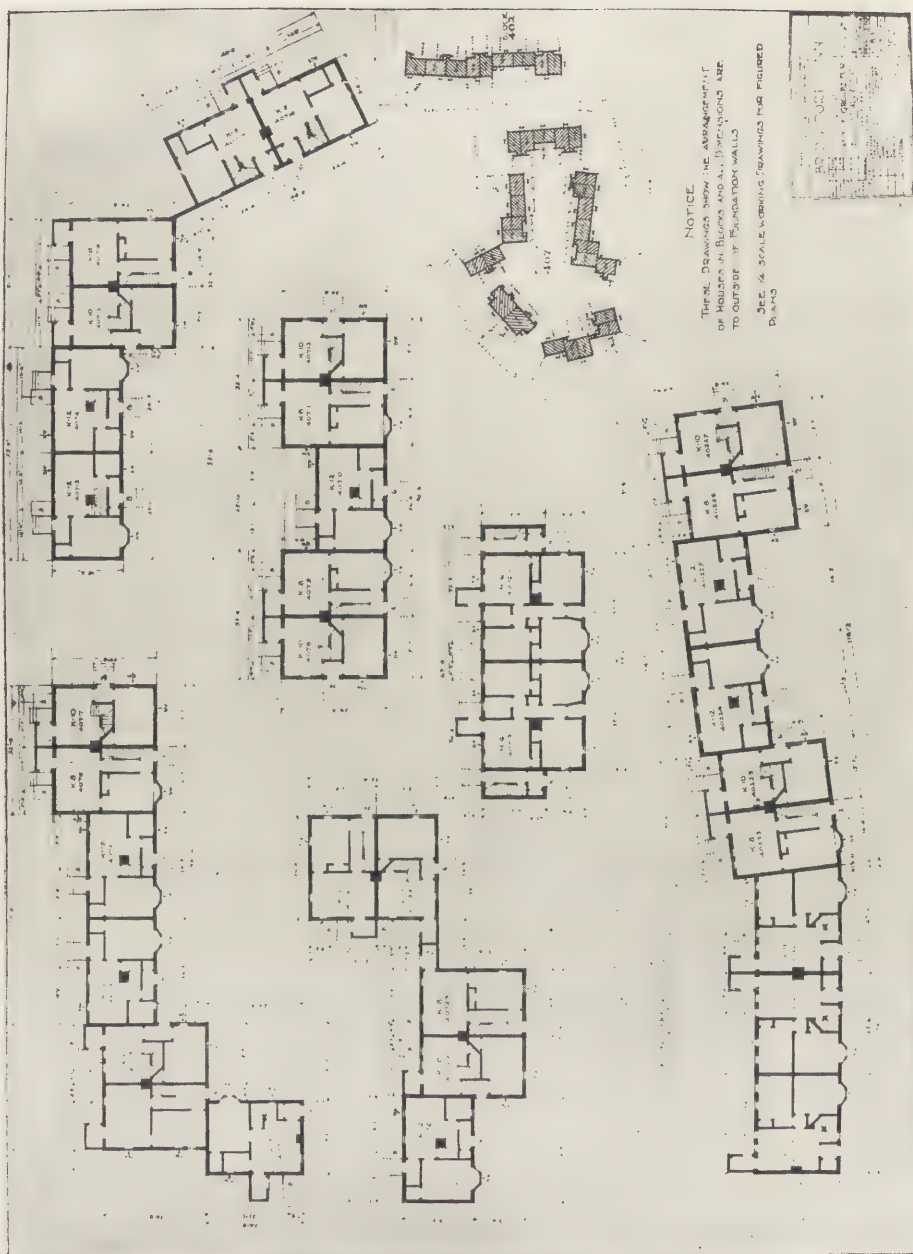
Messrs. Skinner & Walker of Bridgeport have been associated with Mr. Sturgis in the treatment of the Grassmere tract. The other three developments have been looked after in Mr. Sturgis's own office. It was on May 15, 1918, that the architect, together with the other two members of the committee in charge of the Bridgeport project, was appointed. The plans for the four tracts were speedily prepared; on July 31 the work was under contract.

V

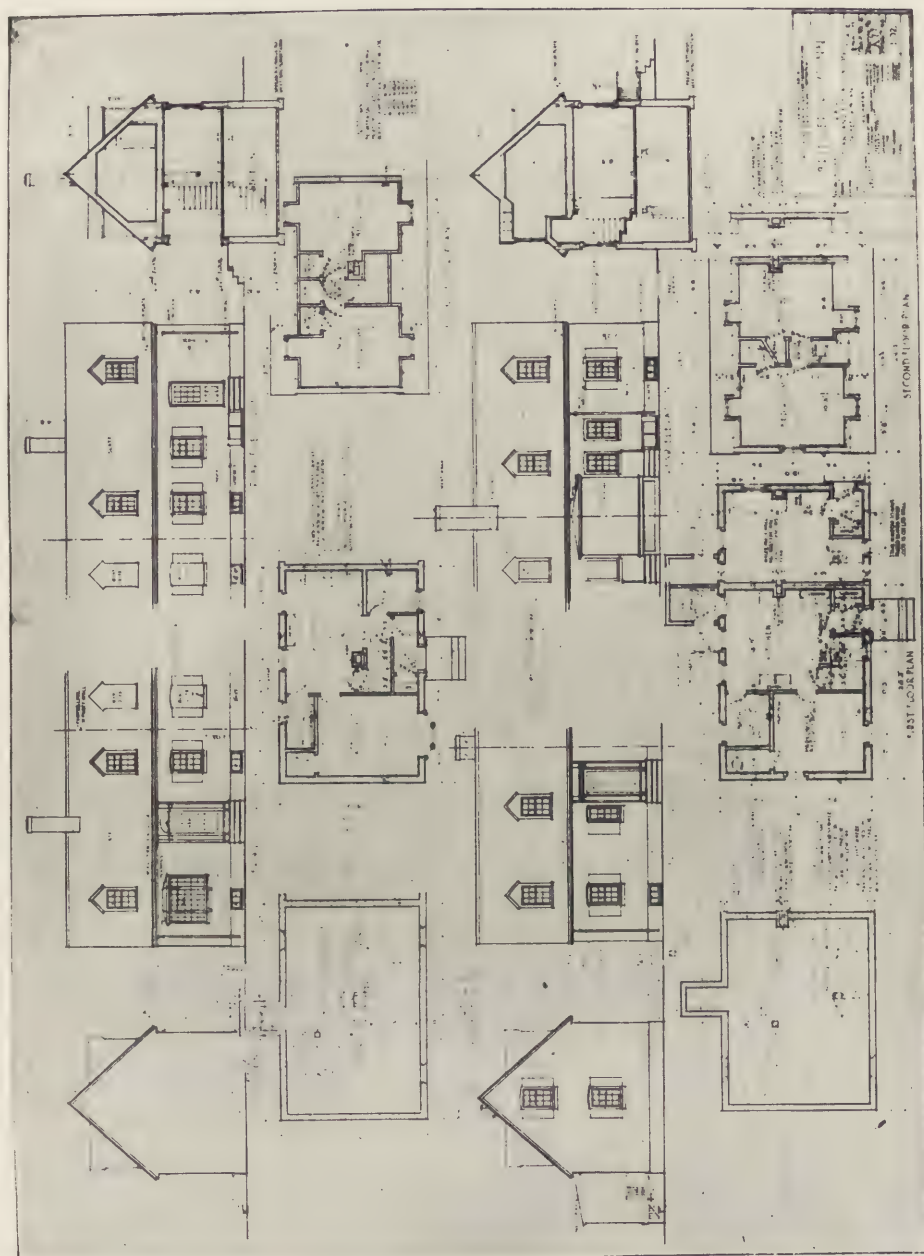
Besides the foregoing, there is a fifth development, undertaken later, and of particular interest as designed to meet the needs of quite a different class of

workers—a grade of low-skilled and correspondingly low-paid labor, employed in large numbers in a neighboring industry occupying one of many factories of the great metal-working concern of the R. T. Crane Company of Chicago, which are distributed among several large industrial centers of the United States. In the work on this "Crane development," as Group No. 4 of the Bridgeport project is called, Mr. A. Hepburn, of the Boston firm of Hepburn & Parker, is associated with Mr. Sturgis as architect.

In a scheme for model housing it is highly important that the class of workers, for whose accommodation it was specially intended, after all be not kept away by making it too good; that is, so attractive as to cause it to be occupied by a higher class of workers, able to pay higher rents. The danger has here been avoided by making the dwellings of a lower grade than would satisfy the higher classes of workers; at the same time they are decidedly better than anything the intended occupants have been accustomed to. So here we have another compact section of Bridgeport, planned for what is commonly regarded as a "tenement" population, but housed under



GROUND PLANS FOR BLOCKS OF DWELLINGS.
CRANE DEVELOPMENT, BRIDGEPORT, CONN.



ELEVATIONS AND GROUND PLANS.
CRANE DEVELOPMENT, BRIDGEPORT



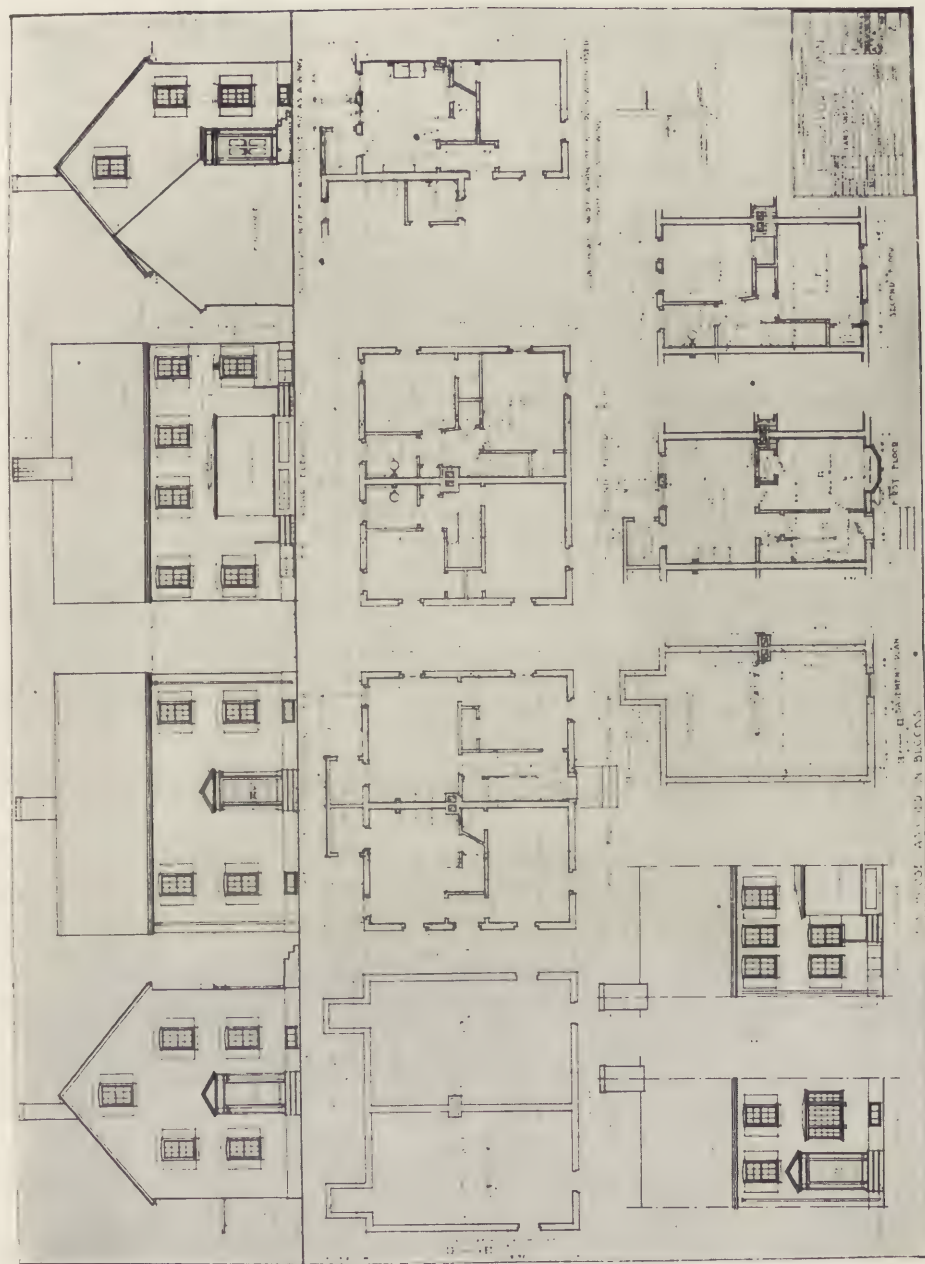
MODEL OF SEMI-DETACHED HOUSE. CRANE DEVELOPMENT, BRIDGEPORT.

conditions strongly in contrast to those of a typical tenement district. In the first place, we have here an outward aspect of the property so attractive that the people of Bridgeport will doubtless "point with pride" to it when they take their visitors over the city—in homely, unpretentious fashion it is not only agreeable to look at, but even beautiful. And being so, it seems morally certain that, by reason of cleanliness and simple charm, it will exert a commensurate influence upon the people who live there—counteracting the slovenly and vicious tendencies of the usual tenement environment and leading them along the first steps of the way to the higher grades of American working-life. People privileged to live here will hardly be likely to content themselves again with anything worse, but rather will learn to appreciate something better and seek to fit their children for higher grades of work. The occupants of these dwellings are for the greater part somewhat skilled workers in the lower and rougher grades of employment, such as are largely employed in the big factory near-by.

The site is a rectangular property of 22.176 acres, almost flat and so near the

sea-level that an embankment has been necessary to avert flooding at times of abnormally high tides. The plan well illustrates the possibilities and advantages of a non-rectangular development in economizing ground space and street construction and equipment with due regard to convenience of movement and the maximum benefit from sunlight and air, together with the housing of a population as large as such a tract can hold without congestion.

The houses are single dwellings, built in rows. Instead of monotonously stretching along the streets, the houses are designed in groups of units varying according to street layout and other conditions. Pains are taken to provide each family with ample back-yard space. The greater number of the dwellings are of one and a half story; but to meet the strong tendency in Bridgeport to live in flats, numerous two-story houses are provided for, as well as 14 four-family houses of three rooms each and 56 two-family houses of four rooms. One hundred and fifty-five single-family houses are of a two-story type. The plan provides for ultimate dwelling accommodations for 377 families, or about $12\frac{1}{2}$



GROUND PLANS AND ELEVATIONS.
CRANE DEVELOPMENT, BRIDGEPORT.

families to the acre. This means a fairly dense, though by no means congested, population.

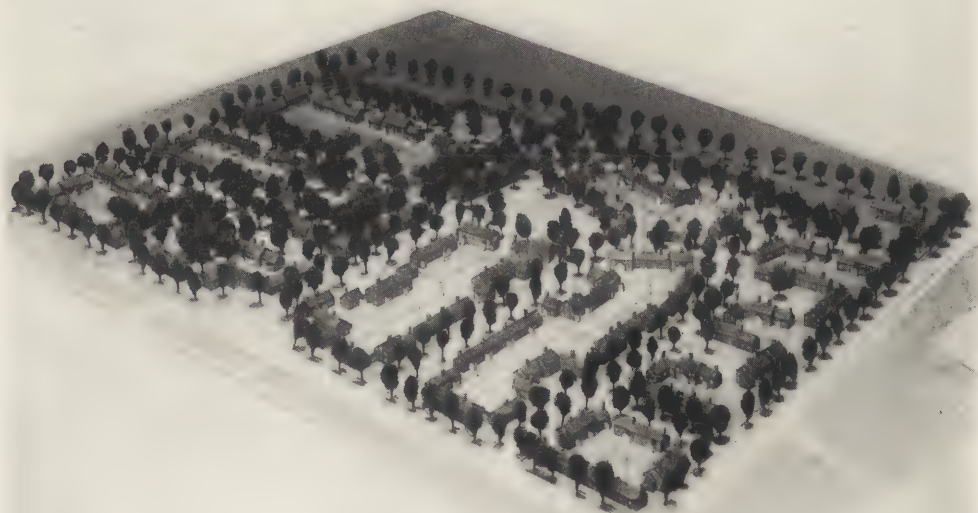
Higher grade workers would require living rooms and dining rooms; but here each dwelling has only a large combined kitchen and living room to accommodate all the indoor social requirements of a family. There is no provision for any special heating apparatus beyond a jacketed stove in the kitchen, sufficient to warm comfortably the entire house. But every house has a cellar where a single-register furnace could be installed if desired. There are gas ranges and electric lights. Each dwelling has a good bath room.

VI.

The controlling motive in planning and in the architectural treatment of this layout is to give, in terms of brick instead of frame construction, the effect of an old-time New England village, like Marblehead or Ipswich. The charm of the rambling streets and picturesque group-

ings in such a village derives itself largely from the sheds and other outbuildings casually built against the houses from time to time as utility may have called for them. So here a similar charm is obtained by composing the groups in varying sizes and heights—the units being irregularly joined and showing gable ends in varying relationships.

Neither is the irregularity in general plan at all arbitrary, merely for the sake of picturesque effects. While there are no abrupt declivities to call for them, as in Marblehead, this tract has many fine trees, and it was the recognition of their value that led to perhaps the greater number of these more suave departures from straightness—as in the varying depths of setback in house fronts from the street lines. A noteworthy instance is the way in which Forest Court is diverted from its normal direction to save a fine group of trees at the corner. While two of the border streets of the tract have houses facing them, a third, South avenue, has a character so disagreeable



MODEL OF A TYPICAL BLOCK OF DWELLINGS. CRANE DEVELOPMENT, BRIDGEPORT, CONN.

that it was wisely decided to have the dwellings on that side of the improved tract face away from it and toward Sims street, one of the highways within the property. Characteristic features of this development are the various deep forecourts with irregular house rows facing them and approached by service roads in the courts, which, together with unusual space for shade trees, shrubbery and grass, give playground room here and there for small children.

Noteworthy is the way in which the central cross street (Burnham street) is made to serve the traffic that comes to and from the heart of the city by two streets on the Iranistan avenue side. Almost halfway between these approaching streets Burnham street enters the property from the middle of a sort of atrium-like open space bordered by a conspicuous grouping of dwellings. In the long row of houses on the left of Burnham street, just beyond its intersection with the central longitudinal thor-

oughfare, Flanders street, a slight departure from a straight front in the long block of dwellings at the corner may be noted on the plan. Like similar instances in old New England spontaneous layouts, this departure may be hardly observable as such, but it has the value of enhancing the effect of the perspective. The motive for this departure is to give room for existing trees. Elsewhere a fine tree-group is preserved by planning the backyards to include them. Flanders street and its parallel, Alsace street, are gently curved to meet each other toward the northerly side of the property, merging in a street that makes a good common approach to the Crane works. At the backs of the houses wire fences, separating the adjacent back yards, give an open effect and tend to discourage untidiness on individual premises, while long hedges of privet run at the backs of the lots. An attractive feature of the development is the little flatiron-shaped public green near the center of the property.

PROFILES AND MATERIALS



By William Luther Mowll



WHEN mouldings are made of white material they show in the highest degree the effects of contrast and gradation. Color and texture modify the effects of light upon their surfaces; and other physical properties, such as resistance to crushing and bending, to pulling apart and so on, limit their size and shapes.

A uniformly colored surface is less marked by contrasts and gradations than a white surface of the same shape. The darker the color the less visible is the form; consequently, when mouldings are executed in materials of dark color they must be larger and more vigorous in profile in order to produce appreciable effects. Similarly, to produce equal effects, forms placed in shaded positions must be larger and bolder than for well lighted positions. Parti-colored arrangements tend to exclude mouldings. The contrasts of the mouldings are lost in the contrasts of color. Both means of producing contrasts perform the same function of emphasis; and, used together, usually produce a redundancy or over emphasis.

Texture introduces other consideration. In many materials, the color is not flat and uniform as on a painted surface, but is marked by grain, or mottling, or other variations. These markings are usually of such a nature that it is on their account the material is chosen. In the woods used for finishing interiors, for instance, there is an extensive palette of colors and patterns of grain, from which the architect may choose tones and figures. These materials not only show their characteristic qualities to better advantage in plane surfaces, but it becomes more and more useless to mould their surfaces as the size and distinctness of the pattern or figuring becomes marked. The effect of a moulding is produced by its shape contrasts, which count as bands of varying degrees of breadth and definiteness. These bands are at times in-

terrupted deliberately; but, in such cases, the repeated forms, such as the heart and dart, are used at regular intervals, and the added details are of such shape as to enhance the intended effect of the surfaces upon which they are placed. The grain of wood or the figure of marble, however, falls upon the moulded surface irregularly, seriously disturbing its lines and clearness. Reciprocally, the different planes and curved surfaces of the moulding throw out the pattern of the material in which they are shaped. As wood or marble is chosen for the very quality thus disrespected, the omission of mouldings from such materials is seen to be a furtherance of the designer's purpose. The choice of a material involves the choice of its characteristic forms. The choice of a form excludes those materials to which it is not characteristic.

The physical properties so far discussed are of such a nature as to influence forms because of the appearance of the finished result. Hardness, density, toughness, and other kindred properties, however, have a direct part in the determination of the shapes and dimensions into which the materials which they characterize may be worked. The complexity of these relations involves some knowledge of the characteristic properties of each material.

The materials at the disposition of the modern architect are of two principal sorts: natural and manufactured. Stone and wood are used in the state in which they are found, except for changes in dimension and shape; the other materials used in building undergo some process of manufacture to render them suitable for use.

Of all the materials from which an architect may choose, stone has always been his preference. The more usual kinds are stones having the principal characteristics of granite, limestone and marble.

Granite presents the greatest difficul-

ties to the stone-cutter. It is split from the ledge by drilling rows of holes and by breaking off the slabs so outlined with the aid of compound steel wedges. At the stone yards the blocks are reduced toward the finished shape by breaking off pieces with the aid of heavy steel sledges and splitting hammers. Where slabs thinner than those quarried are desired, they are produced by a very gradual sawing process. Beyond the point where the block has been given roughly the shape desired, the successive steps consist in removing the surplus stone, bit by bit, by heavy blows delivered through stout tools from a heavy steel hammer. Although, in recent years, pneumatic tools have greatly reduced the labor of granite cutting, smooth finishes are only to be attained at the expense of long and severe labor. The granites are so hard that they take on an enduring polish, produced after several processes of finer and finer cutting, followed by long rubbing. The polish is much more easily applied to plane surfaces of considerable extent. The nature of these processes is such as to result naturally in forms bold, strong and vigorous.

Limestone and marble are both cut from the quarry by channelling machines, which plough like a large steam-driven wood plane with a narrow blade, cutting slots in the rock and so detaching blocks which are then sawed into slabs of desired dimensions much more rapidly than can be done with granite. A machine planer is used in the production of moulded surfaces both in limestone and marble, it being a very simple matter, once the slab of stone is bolted on the reciprocating bed of the machine, to plough out of its surface almost any required profile. Both marble and limestone balusters and columns are turned in lathes much more easily than granite.

In distinction to limestone, white marble is of much finer texture and is capable of taking a polish. Forms may be produced, in marble, of the utmost refinement and delicacy—to the limit of visibility, in fact, even at short range.

There is a gradation in these materials, from hardness and roughness and grayness at the one end to smoothness and

fineness and whiteness at the other. The granites vary sufficiently in character, so that the finer and softer grades approach limestone in their possibilities; and the coarse marbles sufficiently close the gap between the finer marbles and the limestones.

The three illustrations which follow are of buildings constructed respectively of granite, limestone, and marble. In each case the designer has used the material suitably.

The section through the cornice of the Broadway Institution for Savings, by York & Sawyer, shows bold, vigorous forms. The panels in the soffit merit attention. This order, according to Vignola, does not show any such soffit panels. The material is dark, and the position of the panels is such that they are not well lighted. They have, consequently, been made deep, and without the small mouldings usual to such features.

Compare this with the marble cornice of the Knickerbocker Trust Building, at Fifth Avenue and Thirty-fourth Street. Here the whiteness and facility of the material has permitted the introduction of a very delicate treatment in a similar position. The Broadway Institution for Savings is in every line of its treatment broad, severe, simple, large in scale, admirably studied in harmony with the material. The Knickerbocker Trust Building is in marble, because the means at the disposal of the architect were such as to permit a great deal of carving. The marble was chosen because it could be carved in these forms; and, being chosen, the scale is relatively delicate and the surfaces moulded and enriched.

The detail of the Gorham Building is intermediate in scale, because its material, limestone, is intermediate in color and in freedom under the chisel. The comparison is not theoretically perfect, because the Knickerbocker Trust is Roman in the fullness of the profiles and in the opulence of its carving, while the scale of the material in the Gorham Building is a little forced toward fineness by the studied reflection of Florentine delicacy in its outlines.

Above the bed mouldings, the cornice of the Gorham Building is of copper.

Except for this difference, the arrangements are similar. The cornice block of granite is 1 foot $5\frac{1}{4}$ inches high and that of marble 1 foot $6\frac{1}{4}$ inches. There are five divisions in the former and seven in the latter; that is, there is one division for each 3.45 inches of height in the granite cornice, and one for each 2.61 inches of the marble cornice. The next section, from the underside of the cornice to the bottom of the bed mouldings, is 1 foot $9\frac{1}{2}$ inches in the granite cornice, and 1 foot $11\frac{1}{2}$ inches in the marble cornice; there is a division for each 3.58 inches in the granite and one for each 3.35 inches in that of marble. The architraves are respectively 2 feet 1 inch and 2 feet 11 inches in height; there is one division for each 4.28 inches in the granite and one for each 3.5 inches in the marble. Following the same method of comparison, it appears that the bed mouldings of the limestone cornice, which are 2 feet $1\frac{1}{2}$ inches in total height, are so divided that there is one division for each 3.64 inches of height; and that in the architrave, which is 2 feet 3 inches in height, there is one division for each 3 inches of height.

These materials are not separated by limits of scale beyond which it is impossible to pass. Each has a considerable range. In one particular only is there such a boundary, and that is in the smallest possible member. This involves not only the nature of the material but also the skill of the workman in cutting the material without breaking it. In these cases the smallest fillets are respectively one-half inch for the granite, one-quarter inch for the marble and three-eighths inch for the limestone.

The other differences are to a certain extent indicative of other design considerations besides those involving the material itself.

The character of the carving should be compared. The elaborate frieze of the marble building would be much less effective in limestone if it were possible at the same scale. The wide egg and dart moulding of the limestone building has contrast enough so that it counts clearly in the darker material, and differs from that in the marble building in

that the dart is not cut away from the cup of the egg. This leaves the dart and the cup forming a mass which can be cut with less danger of breakage than if the parts were separated as in the marble design.

If the profiles of the bed mouldings or of the cornice of the Institution for Savings are compared with a text book order, it will be seen that the members are less numerous here. The modillion is rectangular, not only because this form harmonizes with the other forms of the façade, but also because no more detailed form would be suitable to the material. The crown mould of the cornice itself is $9\frac{1}{4}$ inches high, giving space enough for each of the few parts at the large scale necessary.

A comparison of this baluster with that of the Knickerbocker Trust Building emphasizes the difference in scale. There are nine divisions in height in the Institution for Savings and twenty-three in that of the Knickerbocker Trust. In the cap of the Institution for Savings, in a height of $8\frac{1}{2}$ inches, there are only two members; in the cap of the other, in a height of 1 foot 1 inch, there are six divisions, and really more, as the little soffit with its drip count as additional members in any view of the building.

This comparison of three of the many materials at the architect's disposal shows in only the most general way the effects upon design of the particular material in use. An extension of such comparisons on the part of the student of architecture is a fundamental step in appreciation.

It must be pointed out, by way of caution, that in recent buildings architects have many times gone beyond the limits which would be naturally chosen by a workman familiar with material in use. Present conditions separate the architect too far from the material in which he works. The best examples, therefore, for such study are those in which it is certainly known that the craftsman has had the proper chance to have his judgment heard.

There follows a general review of other materials used in building. Wood is the material the use of which is most familiar. The development of design in

this material has followed two main courses. Wood has been given forms like those of stone, with variations in scale due to its own properties. It can be cut into forms as fine as those of marble; in this case it is usually painted. Light tones on the surface develop the visibility of its forms. Except for its ability to resist stresses better than plaster, it has in this case no advantage over that material, which has replaced it in many uses to which painted wood was formerly put. On the other hand, wood is used on account of its natural beauty. Its variety of patterns rivals marble, and it suggests a warmth and an intimacy impossible to that material. Just as is the case with marble, the grain of unpainted wood prohibits the use of fine profiles; wood is best used in plane surfaces, with few and simple flat mouldings in scale somewhat larger than marble.

The materials which must be compounded as well as shaped are concrete, plaster, burnt clay, steel and iron, and other metals, chiefly brass and bronze, and glass. The processes by which these materials are made ready for use fall into curiously few categories. All of the substances which are used in mass form, as distinguished from rolled sheets or bars, are moulded, including plaster, concrete, and all building materials made of clay, iron, and bronze. Concrete and plaster are moulded cold and harden chemically; the metals are melted and poured. The shapes which they each take have as limiting factors the properties of the particular material in its finished condition.

Plaster is capable of being cast or run into the finest of forms. The first step in the production of any modelled form is the making of a model in clay. From this a mould is made, usually in an elastic material. The elastic material is held in position by an enclosing removable box. The flexibility of the mould permits any desired effects of relief or undercutting, and it can be sprung off from the hardened plaster without damaging the latter. The resultant forms of the plaster cast in the mould are capable of finish by painting, bronzing and so on.

Their use is strictly limited by the fragility of the material. Plaster work is so easily liable to damage that it must be entirely excluded from locations where the surfaces are exposed to contact. Plaster properly used is a worthy material, the substance of many beautiful architectural details; and while it is the least enduring, it is the least expensive material in which beautiful forms may be produced.

Concrete may, in many respects, be worked like plaster. It is cast into all architectural forms, from piers and walls to statuary. It is chosen for the structure of a building because of its hardness and rigidity, and in preference to stone because it costs less. No method yet perfected, however, has produced walls cast in forms built at the building which can be finished in such a manner as to present a pleasing appearance. In order to keep the cost down it is necessary to use inexpensive labor and relatively rough methods. It has been used with success in engineering works in broad surfaces which are so situated as to be always remote from the eye, so that the irregularities are lost in the general effect.

This material is also made into blocks to be used in place of stone. The crushed stone and cement of the material are poured together into moulds forming blocks, the surfaces of which are afterward dressed in the same manner as natural stone, presenting a surface not unlike a brecciated marble. In this use, and with a marble aggregate, the surface is sometimes polished. As a building material it may be made quite equal to natural stone in hardness and endurance.

In the production of mouldings and other forms of detail concrete is limited only by the sand process of moulding, which does not permit of re-entrant mouldings. To take the place of carving, a very fine concrete is used, which is cast in elastic moulds, such as are used for plaster. The relative expensiveness of this latter process places it out of the rank of possibility commercially, except for forms many times repeated.

In scale, mouldings in concrete will usually be not finer than in limestone.

Although the material is very hard when thoroughly set, it is usually necessary to handle the blocks when green, in which condition they are more liable to damage than is stone. This makes it necessary, in designing, to avoid edges too sharp and too isolated. For fine buildings the choice will naturally be of some material which will provide the beholder with more satisfaction in texture and color.

Terra cotta differs from the preceding materials, because it must be baked at a very high temperature. The original model is, as before, made in clay and cast in plaster. The clay block is then pressed into a reverse mould of plaster and dried. Up to this point all the refinements possible to plaster may be introduced. In the process of baking, the tremendous and sustained temperature would actually melt thin projections. Further, as the blocks are made of a clay, which is not pleasing either in color or texture, the finished surface is produced by spraying the block, before the baking process, with a "slip" of creamy consistency which, besides providing the color and texture, has a tendency to diminish the sharpness of all angles, especially the interior angles, and will completely fill all small interstices. It is impossible to prevent a considerable amount of shrinkage and distortion in the blocks. On this account, the design must be of such a character that a certain amount of irregularity in line does not seriously affect it. An allowance must be made for joints somewhat larger than those possible in stonework. Because of these factors the general scale cannot with success be made finer than with limestone.

Undercutting and a free use of ornamentation are easily attained by the moulding processes. The blocks must be small compared with stone, because the distortion in baking is less in small blocks. As terra cotta is always anchored to or supported by steel, the projections of members are not limited. The surface may be any color within the range of chemical possibilities, which excepts only certain reds that no manufacturer has yet seemed able to obtain.

This is one of the few materials of

permanent character in which the architect may use color out of doors, with, at the same time, control of the texture. In the novelty of this experience, color and form have been used simultaneously. Whole sets of forms, designed as pure forms, have been picked out in a variety of colors. Each applied color varies the effect of the surface to which it is applied to a greater extent as the color is darker. Profiles of a group which are harmonious before the application of color are thrown out of relation by its presence. The effect of form is diminished by the presence of a single tone. It is destroyed by the presence of a variety of color. The success of moulding forms is dependent upon uniform color. It would seem to be true that terra cotta is best used either in uniform color and modelled or in relatively flat surfaces with variety of color.

The metals also are cast in moulds. Iron is cast in sand. The limits of this material are due to its granular texture; and its brittleness limits the length of unsupported members in proportion to their thickness, so that its parts must be thicker than wrought iron or bronze. Its color is not a factor, as it must be protected by paint to prevent oxidation.

Bronze, which is also moulded, is superior to cast iron in smoothness of texture. It presents a surface which weathers in such a manner as to become one of the most beautiful available. It is superior to iron in rigidity, so that the keenest, sharpest, and deepest of moulding forms may be executed in it in permanent forms and at the finest of scales.

This leaves to be considered the wrought metals. Iron, of chemical composition different from that used for casting, is rolled hot into bars of various sizes. These bars are reheated and forged into the familiar forms of this material. The profile forms are limited to such as may be produced under the hammer during the malleable period. They are naturally simple in form. The scale is about that which can be attained in cast iron. Wrought iron work is essentially a craft; and the designer is strictly limited by the capacity of relatively few workmen, as well as by the

resistance of the material. The triumphs of this branch of workmanship in the production of elaborate scrolls and leafage have been attained only by very special skill and are only reproducible by a rare workman, whose ability fixes the limits of the design. It may be said that limitations of this same character are only less binding in every branch of architectural design. No building can exist by and through the efforts of the architect alone. The workmen must carry out the design; their place is not sufficiently acknowledged and, in many of the building trades, they are not sufficiently occupied.

The sheet metals, copper and iron, are worked cold. Profile forms are produced in machines by bending the sheets, in which case the mouldings are hollow and

are supported by brackets of some rigid material; or they are drawn on to wooden cores. Copper, on account of its superior ductility, may be used to produce finer forms than iron, perhaps down to the scale of cast iron, although the dark color of the surface usually dictates a choice of bolder outline. Iron is incapable of sharp bending without breaking and is limited to not less than the scale of limestone and this only with much rounding of the angles.

To sum up, the forms of mouldings are, first, motived by design and direct a choice of material. They are then subject to the restrictions of the particular material in which they are to be executed. When these restrictions have been accepted they have always served to develop a beauty due to fitness.

MODERN INDUSTRIAL PLANTS



By George C. Nimmons

Part IV.

DISCUSSION OF THE VARIOUS TYPES OF WINDOWS
FOR INDUSTRIAL BUILDINGS.

THE subject of the various types of windows is one of particular interest at this time, because of the improvements that have been made in natural lighting by the general use of the different windows so extensively advertised and sold on the market.

An outstanding feature nowadays in industrial buildings is metal sash in large quantities. The various kinds of sash have much merit and have accomplished much in improving the natural lighting of buildings, but many of them have two defects which are well worth eliminating, as they are so serious in many cases as to cut down their efficiency materially. Metal sash windows are usually divided up into many small panes of glass, which are the greatest dust and dirt catchers imaginable, the many small divisions making it almost impossible to clean them. The second defect often encountered is an entire lack of means by which such windows can be opened so as to get at the outside of them for cleaning.

Often such metal sash windows are placed high up in the air in positions where they are absolutely inaccessible except by a painters' scaffold.

The amount of radiation and piping necessary to heat a building is proportioned to the amount of cooling surface of the glass in the windows. Every foot of glass in the windows means the consumption of so much coal in the boilers. Large windows make the coal bill high; but this, as a rule, is a good investment, provided the windows are kept clean and made to produce a fair return of good light in exchange for the extra coal which is being consumed on their account.

The original reason for small panes of

glass was the economy in first cost and in renewal of breakages, but now that the economical methods of producing sheet glass have reduced the cost of the large lights, the reason for small lights no longer applies, especially as the very considerable cost of all the small metal sash bars must also be taken into account.

If, then, in selecting steel sash, a type of window is chosen which lights the building reasonably well and has glass of proper size with as few horizontal bars as possible and with adequate means of getting to the outside of them for cleaning, then the enduring lighting efficiency of such windows will be greatly improved. The essential for designing sash so as to be easily cleaned is to make the lights of glass sufficiently long so that a man with a window cleaner can cover as long a space as possible with one downward sweep of his arm without encountering cross bars that intercept the operation. The width of the light of glass does not make so much difference as its length, so long as the width is sufficient for the ordinary window cleaning device to pass between the vertical bars.

The former requirements of the fire insurance underwriters are responsible for some of the small divisions of sash and the difficulty of getting to the outside of them, but now these rules have been changed so that for walls exposed to fire hazards suitable improvements can be made in conformity with the new regulations.

In situations where the work must be screened from the sunlight, windows should be chosen of a type which will permit of the operation of shades.

Metal windows are made with sash



PLANT FOR THE COLTS PATENT FIRE ARMS COMPANY, HARTFORD, CONN.

Aberthaw Construction Company, Boston, Builders.

This represents a type of skeleton reinforced concrete construction erected by many industries engaged in the manufacture of war products.

which pivot, hinge or slide. Many makes have been tested and approved by the underwriters and there is a kind of window to be had for almost every purpose. Some of them are most skillfully and accurately made, and operate in their various parts like a piece of fine machinery.

If metal windows are not to be used, there is no objection to the old wooden frames and sash, provided they are strongly made, free from cracks around the frames, and designed, as they should be, so as to be durable, easy of operation, and readily cleaned.

STAIRWAYS, ELEVATORS, SPIRAL CHUTES AND CONVEYORS.

The location of stairways, elevators, spiral chutes, and conveyors must first depend on the convenience of employees and operators, the travel of material, and the routing of production in a plant. City ordinances usually determine the number and location of stairways. One of the first objectives in the design and location of stairways should be the provision of a safe and direct exit from the building for employees in case of fire. In 1917 the loss of life by fire totaled 1,332 persons, and 5,280 were injured. City building ordinances frequently do

not require a form of construction that is adequate and safe. A stairway should always be shut off from the rest of the building by a fireproof door and walls, and there should be enough stairways of sufficient width so that everybody can safely escape in case of fire, whether the building ordinances of the locality require such provision or not. It is usually required that stairways be placed on outside walls, and as a rule the space next to a fire wall occupied by a stairway causes less obstruction to the operation of a plant than any other, and a stairway so located will serve equally well for two divisions of the building. Elevators should also be inclosed in fireproof walls. The location of the several elevators should never be scattered in any one department if it is possible to avoid it, as the passageways necessary to lead up to them occupy unnecessary space that might be used for production if the elevators were grouped together. Elevators in each department should be centrally grouped if possible, so as to shorten the passageways for a central distribution of goods and materials carried by them, and also in order to allow everyone who uses them the immediate choice of using any one of two or more at the same spot, thus precluding the



MOLINE MALLEABLE IRON COMPANY'S
BUILDING, ST. CHARLES, ILLINOIS,
FRANK D. CHASE, INDUSTRIAL ENGINEER.

necessity of traveling about from one place to another to find a car that is disengaged. It is seldom, if ever, the best plan to place elevators out in the middle of a room, because they thus interfere with the layout and expansion of the production of the plant. What is meant by "centrally" locating them is the placing of them up against the center of a fire wall or some such necessary construction that will make a fitting background for the activities that take place around elevators.

The location of spiral chutes and vertical conveyors should also be worked out upon the same principles. Spiral chutes, however, must always be set out from walls far enough to render accessible the different openings which occur around their circumference in the different stories.

WEARING SURFACES OF FLOORS.

The principal materials used for the

wearing surfaces of finished floors in industrial plants are cement, wood flooring, wooden blocks, asphalt compositions, sanitary floors, tile, brick, and steel plates.

The increase in the carrying capacity of freight elevators from four to six thousand pounds or more has brought about the use of large trucks carrying heavy loads that soon crush the tongues and grooves of $\frac{7}{8}$ " maple floors and wear great holes in the kind of cement finish formerly put on concrete floors, especially if the trucks are not provided with rubber tires and are such that the wheels must be small. Floors made of the different compositions of asphalt have been found to soften up in many cases where the temperature went up too high, while wooden blocks, as they were at first made, swelled and shrunk until they frequently got out of level.

The question of a satisfactorily wearing floor has been a most perplexing one



MOLINE MALLEABLE IRON COMPANY, ST. CHARLES, ILLINOIS.

The center of this 150-foot wide foundry is as light and clean as the space adjacent to the outside walls. Frank D. Chase, Industrial Engineer.

REID
MURDOCH
& CO



WHOLESALE GROCERY PLANT OF REID, MURDOCH AND COMPANY OF CHICAGO, ILLINOIS.

Along the Chicago River it has long been the custom to neglect the design of that part of buildings fronting on the river, which was regarded as only suitable for the back doors and the least attractive elevations of such structures. The above illustration represents an effort to make the river attractive and to improve this waterway by making the elevations of the buildings fronting upon it, interesting and sightly. The wharf just above the water line is of solid concrete where goods are handled from boats, and the projecting balcony above is a sidewalk intended for foot passengers who may pass up and down the river at this level without being obstructed by the handling of material from boats on the dock below.

George C. Nimmons, Architect.

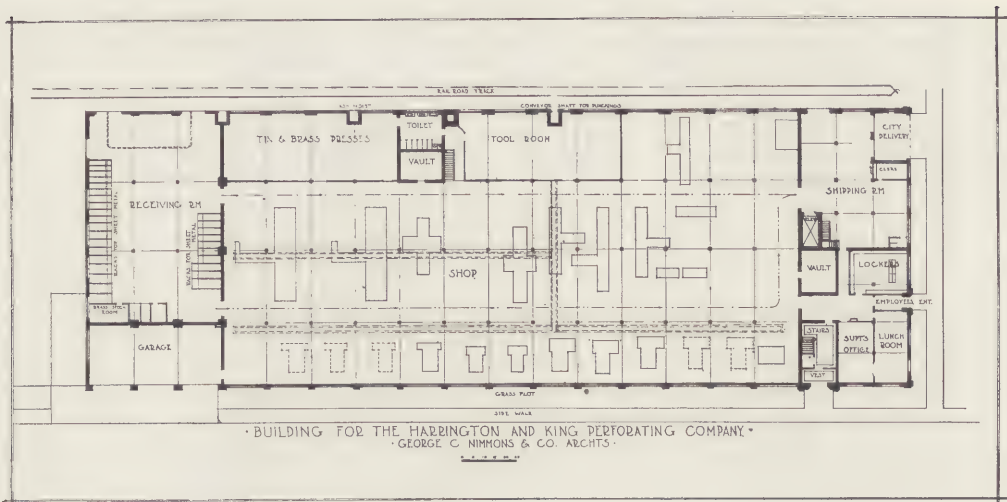


RAILWAY TERMINAL WAREHOUSE AND COLD STORAGE PLANT, CHICAGO, ILL.
George C. Nimmons, Architect.



HARRINGTON AND KING PERFORATING COMPANY'S PLANT, CHICAGO, ILLINOIS.
George C. Nimmons and Company, Architects.

The erection of this building was interrupted by the war, but it is expected soon to be resumed. It is for the manufacture of metal screens for screening all sorts of food products and other industrial materials. Metal screens are to be made here in brass, with holes smaller than the eye of a needle for screening certain food products up to great thick steel screens with holes 2 inches or more in diameter for boilers and for screening various industrial products. The raw material is to be received at the left side of the plant where it is to be taken off cars by a hoist operating on a trolley. Material will be stored in compartments in the receiving room where it will also be cut up into required sizes and worked directly through the plant to the right as indicated. Provision is to be made for automatically catching the metal from the punchings and conveying it by carriers to the room made to receive it. The finished products are shipped away from the shipping room at the right of the building by rail or truck. Offices are to be provided in the two-story portion of the building at the right and provision made for the welfare of the employees. The low tower in the elevation is to enclose the main stairway extending up to the roof.



in many cases. All sorts of expedients have been tried and many of them have not been successful. In those cases where extremely heavy loads must be carried on trucks, the last resort has often been the laying of steel plates. Steel is, of course, the hardest material available for such a purpose and will stand the punishment all right, but not without efforts to buckle up, and not without making a deafening noise every time a heavy truck passes over it.

These discouraging experiences with floors, however, have been accompanied by certain improvements in their construction. Probably every kind of material at all adaptable has been tried on floors, with the result that nothing new seems to have brought about as much improvement as some of the improved methods of using the old materials.

In cases where hardwood floors are most appropriate their durability and strength can be increased in three ways.

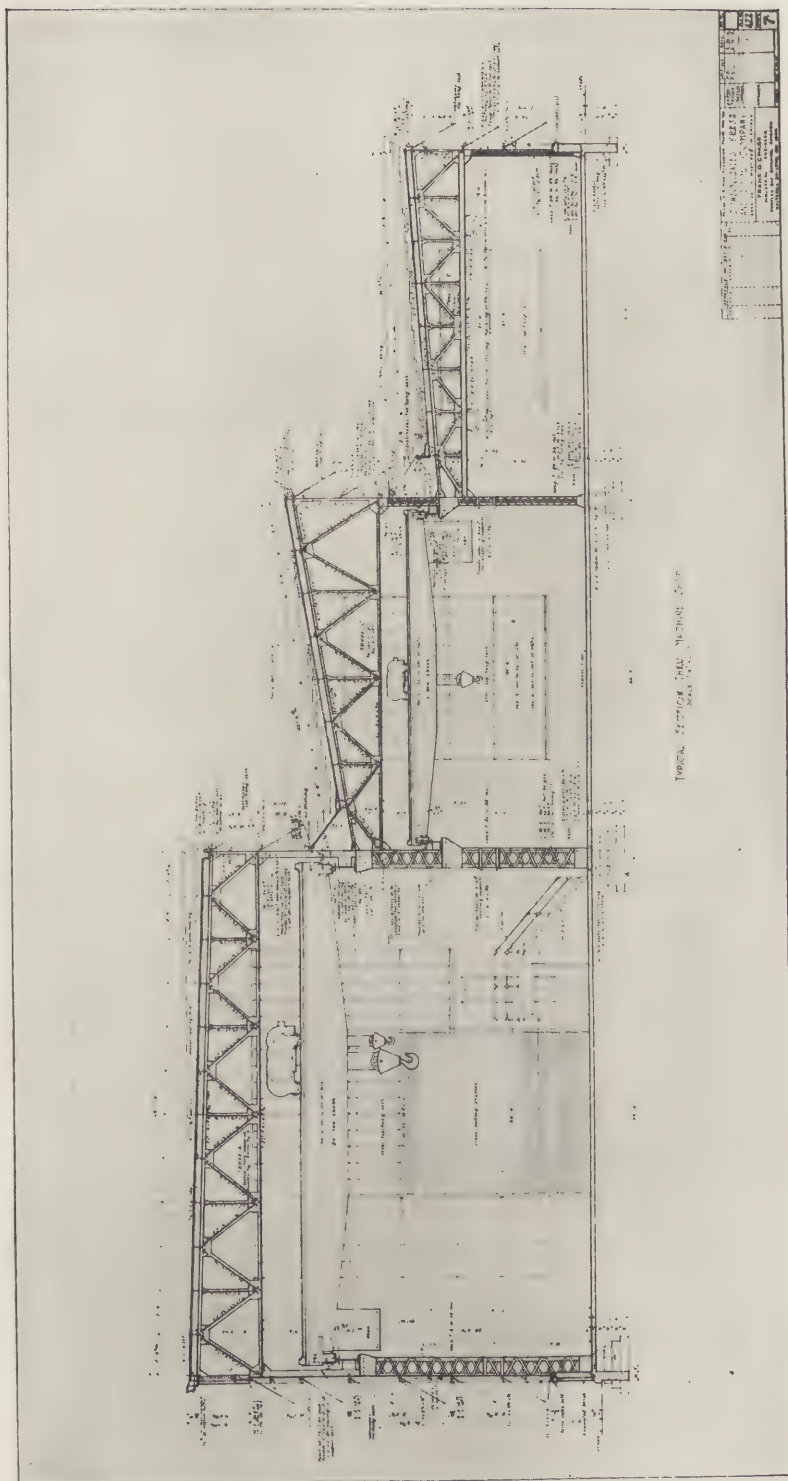
Firstly, one may use flooring one and one-eighth inches thick instead of seven-eighths or thirteen-sixteenths. The extra thickness does not cost much more comparatively and the strength of the floor is at least doubled, as all the extra thickness of wood in this case comes above the groove.

Secondly, it is well to lay down a lining of inexpensive dressed lumber on top of the floor strips in a fireproof building—

or directly on the plank floor of a mill building—as a level bed on which to nail the finish floor. This in a large measure prevents deflection and saves the tongues of the finished flooring from splitting under the weight of heavy trucks.

Thirdly, the strongest board floor of this type that can be made is secured by first laying a lining of inexpensive dressed boards, and on this a maple flooring composed of narrow pieces that have square edges and no tongues and grooves, nailing them well in place right down through the top of the piece. Such a floor will not be quite as smooth as the tongue and groove floor, but will wear much longer.

Many an owner has been disappointed by the unexpected softness of the cement floor finish of a concrete building. His idea usually of the hardness of that finish is the dense and shiny hardness characteristic of a country sidewalk or the basement of a house. The conditions for laying a cement floor finish in a concrete building are very different from these. In fact it is but very recently that a method has been discovered for securing the hardness of country sidewalk in the floor of a concrete building. Soon after concrete buildings came into general use, there were a great many patented mixtures placed on the market to make cement floors hard. These could not in any



CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.
 Cross section through the machine shop showing arrangement of top hung
 sash whereby the center bay is as well lighted as those on the outside.
 Frank D. Chase, Industrial Engineer.



CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.

Frank D. Chase, Industrial Engineer.

One of the striking features of this machine shop is a solid glass front window, measuring 36x280 feet, framed in white enameled brick. Note that the size of the panes of glass are such that they can readily be cleaned.

case make the floor hard unless the cement finish was mixed and put on according to a method which at first was not at all well understood by builders. Some of these mixtures do add materially to the hardness of the floor, provided the cement finish is made properly. The principal trouble with the finish in old concrete buildings was that it was put on too wet and worked with trowels and screeds until the soft particles—which bob up like corks in water—all came to the top, interfering with the crystallization of the cement and producing a substance sometimes as soft as chalk. In the country sidewalk the cinders or broken stone on which it was laid allowed the water to soak away below, but in the concrete building the floor slab on which the finished floor is laid prevented this draining action.

The method that has recently proved so successful does not involve putting a thick layer of wet mortar on top of the

slab at all, but instead consists in transforming the top of the structural slab itself into the cement finish, where just as thin a layer of mortar is used as will level up the uneven places and where perfectly dry cement is applied to enrich and harden the finish as it is worked into shape. All surplus water is immediately disposed of and a covering of wet sawdust and sand is provided to protect the work against damage from rain storms and to allow the construction of the building to proceed without undue delay.

If, therefore, cement floors which are as hard as a good country sidewalk will also be hard enough to withstand the uses to which the building is to be put, then the above dry method of unit construction should be followed. If desired, the addition of one of the good floor hardeners will make it still better.

Improvements have also been made in wood block floors. The material seems today to be better and more seasoned



CONSOLIDATED PRESS COMPANY, HASTINGS, MICHIGAN.

Interior of the main bay of the machine shop, showing abundant lighting from all sides.

Frank D. Chase, Industrial Engineer.



WILDER TANNING COMPANY, WAUKEGAN, ILLINOIS
Frank D. Chase, Industrial Engineer.



WILDER TANNING COMPANY, WAUKEGAN, ILLINOIS.
Interior of saw-tooth vat house, showing monorails for handling skins.

Frank D. Chase, Industrial Engineer.

than it has been in the past, and there are several varieties to be had which have the pieces doweled and grooved in such a way as to hold them securely in place and prevent the top surface from getting out of level.

Brick and tile floors may be used with good effect where chemicals would destroy other materials, and there is nothing better at a moderate cost for the floors of toilet rooms, lavatories and other places where a non-absorbent floor is required, than plastic composition floors.

CONVEYORS AND MECHANICAL HANDLING OF GOODS.

While heavily loaded trucks have increased the difficulty of maintaining the wearing surfaces of floors in good condition, the invention of conveyors and equipment for the mechanical handling of the materials of production has made

it possible to eliminate much of this trucking and reduce at the same time the number of employees so engaged.

As it is intended to incorporate in a forthcoming article of this series a description of the workings of the plant of Sears, Roebuck & Company, where there is undoubtedly the largest variety and number of mechanical conveyors to be found anywhere in a single plant, further discussion of the subject will be deferred.

FIRE PREVENTION AND SAFEGUARDING OF EMPLOYEES.

Fire prevention is a subject that should have a strong appeal to the people of this country, because the United States is—with the exception of Canada—the worst offender in the world. The annual loss by fire in this country has reached the enormous sum of approximately two



BUILDING FOR THE RICHMAN BROTHERS COMPANY, CLEVELAND, OHIO. A STRUCTURE
DEVOTED TO THE MANUFACTURE OF CLOTHING.
The Christian, Schwarzenberg and Gaede Company, Engineers.



THE TELLING-BELLE VERNON BUILDING, CLEVELAND. FOR THE MANUFACTURE OF
MILK PRODUCTS.
The Christian, Schwarzenberg and Gaede Company, Engineers.



BUILDING FOR THE L. N. GROSS COMPANY, CLEVELAND, OHIO.

The Christian, Schwarzenberg and Gaede Company, Engineers.

A shirt waist manufacturing plant.

hundred and fifty million dollars. *The average annual loss per capita in Canada is \$2.96; in the United States, \$2.26; England, 64c; France, 74c; Austria, 32c; Germany, 28c, and even in Russia, where they have long winters and lack our improvements and development of fire apparatus, it is only 97c.

This loss of course is paid for by everyone who carries a dollar's worth of fire insurance. The fire-trap buildings are responsible for it, and every owner who adds a new one to the list not only subjects himself to the risk of the complete destruction of his plant and serious interruption to his business, but at the same time causes everyone who carries fire insurance to pay for that loss in the form of high insurance rates in case it burns down.

The fire prevention laws in this country fail to prevent fires to any reasonable extent, otherwise America would not be next to the head of the list of those nations which permit the greatest waste and destruction of their own building resources in this way.

* Amounts taken from the Report of the Conservation Commission of Canada, which has recently been issued.

Canada, the worst offender, is just now wakening to a realization of her failure in this matter, and has recently issued a most valuable report on the subject, indicating the reforms to be acted upon in that country. The heavy annual loss suggests that it would pay this country well to investigate and to control the situation by proper legislation. Such a burden upon the industries materially increases the cost of production, as the expense of maintaining adequate fire insurance in this country is four or five times greater than it is in Europe.

In the meantime, if every owner who builds would only voluntarily do what he could to prevent the spread of fire, he would not only secure lower insurance rates, but would help greatly to reduce the annual loss. If one cannot construct a building to be absolutely fireproof there are still many preventive measures that are well worth the taking.

Fire walls, incombustible walls to inclose stairways, elevators, chutes, and courts are a fine investment. If every opening that will allow fire to travel uninterrupted from one department

to another is cut off by something that will resist or even retard the fire, a building can often be saved from complete destruction. There are many varieties of fire-resisting windows, doors and coverings devised to protect exposed portions, and also a sprinkler system like an automatic fire department, ready to put out a fire as soon as it starts.

There is no question about knowing how to build so as to prevent destructive fires, as the Factory Mutual Insurance Companies of New England and the National Board of Fire Underwriters have both worked out rules from their experience that will, if applied, accomplish the desired end. The Underwriters' Laboratories of Chicago are just now completing a test of one hundred columns, representing all the kinds in existence. Over two years have been consumed in preparing for and making this test. The columns are full size, heated in a great furnace under an enormous load, similar to that of a high building, and when the columns are white hot (with a heat sometimes over 2,000

degrees), cold water under high pressure is thrown upon them, and the result in each case scientifically recorded. When the test is completed it will be possible to determine how every kind of column for a high building would behave if subjected to a fire such as that at Baltimore or San Francisco.

All such knowledge and all the information and rules of the Underwriters and Factory Mutual Insurance Companies exist for the express purpose of diminishing fire loss, and the only way to accomplish this end is for all concerned to take advantage of this expert knowledge and use it, as it will be gladly furnished to all those about to build.

Physicians and others serving on city and state inspection boards have in recent years rendered valuable service by disclosing conditions in workshops which are injurious and produce diseases, and as a result of these discoveries, many devices and changes have been effected in factories that have improved conditions materially.

Chief among these are sanitation and



BUILDING FOR THE SYMINGTON CORPORATION COMPANY AT ROCHESTER, N. Y.

Parker Thomas and Rice, Engineers. Crowell, Lundorff and Little, Builders. The skeleton steel construction of a type of ammunition plant erected in different parts of the country. The interesting form of roof trusses indicates how light is admitted in the center of such buildings, where important parts of the work are done. Tracks may be seen for the traveling cranes, which are largely used for handling material and products.

plumbing, which have been developed to a higher state of perfection in this country than in any other. American plumbing goods are known the world over.

A great deal has recently been done to improve artificial lighting. When electric lights first came into use, the bright glare from high-powered lights was for quite a while a frequent cause of eye disease, headaches, and nervous affections. Today, scientifically designed fixtures and methods of lighting are made to put the light on the work and at the same time shield the eyes of the worker. General illumination of the interior of buildings is also accomplished now by partially or wholly concealing the bright glare of the illuminants. Where intense rays of light come from the work in hand goggles for the eyes are very extensively used.

For a long time nothing very specific was done to stop or mitigate the injurious effect of dust and poisonous gases. In the most improved factories exhaust pipes have been contrived to remove such injurious gases and dust at their source and prevent their escape into the workroom. In other cases it is quite common for the workmen to wear gas or dust masks in the departments where such conditions originate. Some of the museums have photographs made microscopically of all the different kinds of dusts produced in the industries, and their effects upon the human lungs. There are some specimens of the lungs of coal miners who worked in poorly ventilated mines, that are quite black from the dust. It has been found that up to a certain point the human system can make away with dust without suffering any particular injury, but when such dust becomes unusually thick and is constantly inhaled for long periods, the screening and filtering apparatus of the body breaks down, refuses to work, and tuberculosis usually results.

The ventilation of buildings has reached quite a high state of perfection. Natural ventilation in summer through the windows is always good provided the air coming from the outside is pure, but when it is impure, or during cold weather, it is now possible to take the outside air,

screen out the cinders and dirt, wash it, warm or cool it, introduce the right amount of humidity and deliver it to any place in the building desired. In hot summer weather air for ventilation handled in this way can readily be made to lower the temperature in a building 10 degrees below that of the outside air. Such systems also can provide for removing the impure air at the same time. There are instances of buildings when the outside windows are made so as not to open at all and where the change and purification of the air inside is done entirely mechanically.

DISCUSSION OF AN ARCHITECTURAL STYLE FOR INDUSTRIAL PLANTS AND LANDSCAPE TREATMENT OF THEIR SURROUNDINGS.

Modern industrial buildings are particularly fitting subjects for treatment architecturally. The varied requirements and functions of these structures are such as can be expressed in designs that are both attractive and beautiful. Many features of such buildings may be treated in the design so as to give an unusual interest and variety to the composition. In fact, they often seem to afford greater freedom and a wider range for expression in mass and detail than other kinds of buildings.

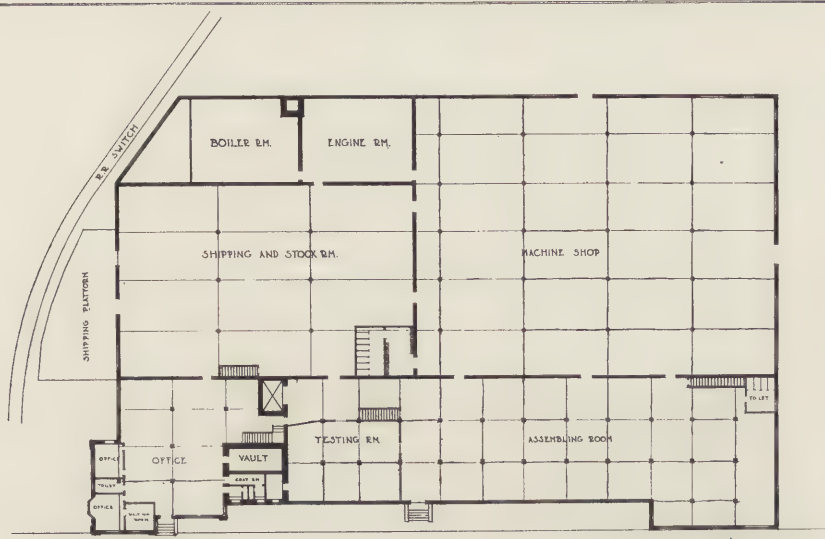
It is probably not true that the designs of such buildings have followed along in the same channel sufficiently to have established as yet what might be called an American industrial style of architecture; yet many designers of these buildings are beginning to indicate a preference for a certain kind of treatment. This statement is first of all logical in being an honest expression of the construction or functions of the building, because the utilitarian nature of industrial buildings, as a rule, prevents the expenditure of much money on elaborate features of a purely ornate character. The design must grow out of what is essential to the objects of the plant. The designers generally seem to have adhered to this requirement faithfully, because the majority of successful designs receive their character from the architectural treatment of base courses, window sills and



AMERICAN ELECTRIC TELEPHONE COMPANY'S BUILDING, CHICAGO.

Nimmons and Fellows, Architects.

An example of the application in a simple way of the Renaissance style of architecture. The sprinkler tank is inclosed in the tower, which has a resemblance to the campanile so commonly seen in Italy. The plant consists of a combination of two-story work shops in front with a one-story intensely lighted saw-tooth skylight construction in rear for the delicate operation of winding electric wires, coils and making the other intricate parts in telephone construction.



PLANT OF THE AMERICAN ELECTRIC TELEPHONE CO.
- NIMMONS & TELLOW - ARCHTS. -

lintels, cornices, copings, piers, gables, penthouses, entrances, projecting departments, towers and all such features as are essential constructive elements of inclosing walls and roofs.

In fact, a close analysis of what a proper architectural treatment is for a factory building would clearly show that it is simply making beautiful and attractive what has to be there anyhow for utilitarian purposes. The first principle of beauty in designing a building is to mold it into beautiful proportions. There is always some way of accommodating the uses of the building and its construction to pleasing proportions without adding any extra materials or expense. Then the proper treatment of its supports, walls and pavilions will follow naturally in arranging the necessary materials of its construction into forms that are attractive instead of ugly.

This is the kind of beauty and attractiveness in an industrial building that does not cost anything and it is also the most important kind of beauty, as it is the basis and foundation upon which all other beauty and adornment of architecture is built. If the problem is one where there is something more desired

than the effect which will result from a strict adherence in the design to the structural and utilitarian necessities of the structure, then this treatment of the necessary features of the building can be done in a more ornate manner and some parts of the building emphasized by proper architectural treatment that will add materially to the good effect of the whole. Entrances, pavilions, or prominent façades may very appropriately be treated architecturally so as to emphasize them and give them the prominence which they may relatively deserve.

Even if the architectural treatment in this way is carried beyond the first stages above referred to, the extra expense of such treatment does not add materially to the cost of the building. It is surprising that so much can be added to the appearance of a building in this way at relatively small cost.

To illustrate by a single example the relatively small cost of treating a building architecturally in design, two illustrations are given of an industrial building built for the C. P. Kimball Company for the manufacture of automobiles. As a strictly engineering and utilitarian design of this building, if built, would have

resulted in a long three-story box effect with an ugly sprinkler tower and water tank above it, it was desired to have something more than this and consequently the architectural design illustrated was adopted and carried out. In order to determine the actual extra cost of this architectural treatment of the building, two designs were made and estimates taken from contractors for the cost of each. These estimates established the fact that the building with the

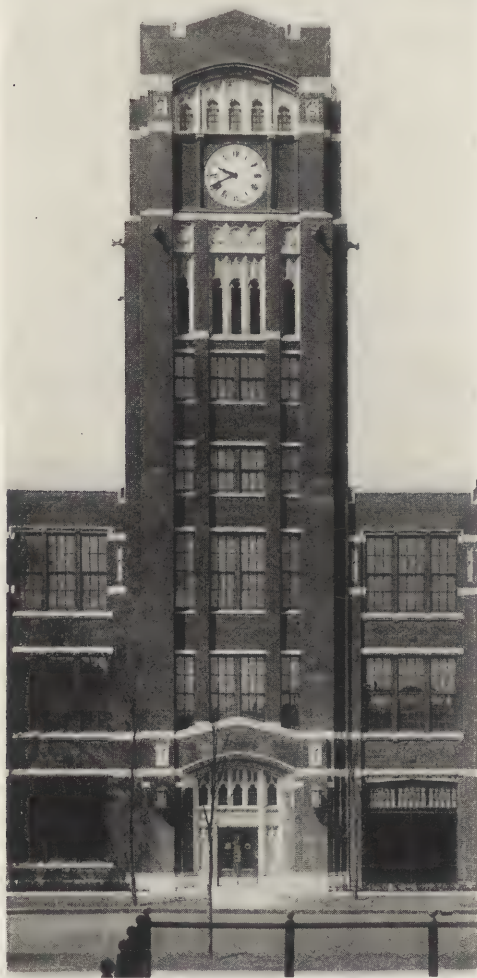
architectural treatment cost approximately 5 per cent. more than the building would have cost if built after the unattractive utilitarian design.

The cost of other industrial buildings by different architects has been estimated to ascertain the extra cost of such architectural treatment, and it has been found that 5 per cent. would represent very well about the average cost of such architectural treatment. It should be made plain, however, that such extra cost would be involved only as in the case illustrated, where the architectural treatment was carried beyond the structural and the utilitarian requirements of the building.

The trend of designers of industrial buildings has been to follow and utilize the materials of the Gothic and Renaissance styles of architecture more than any others, if they followed any of these historic styles at all. A great many plants have been designed very successfully after the Renaissance style, but the majority of designers recently seem to mold their designs with a Gothic tendency. The Renaissance style often demands the use of projecting cornices, which when applied to some types of industrial buildings involve more expense than the Gothic. The upper part of a factory wall can usually be terminated by an ornamental coping that will obviate the necessity of any projecting cornice.

The characteristics of the style of treatment of industrial buildings that is mostly in favor now are Gothic in character and consist usually of piers marked on the exterior of the building, carried up only to the point where the concentrated loads disappear, similar to buttresses, and also walls continued up without projecting cornices and terminated with ornamental copings; the corners of the building are strengthened by the use of piers heavier than the intermediate ones, the entrances emphasized by the use of ornamental tracery and ornament, and the sprinkler tank inclosed in a tower often placed at the main entrance and including one of the principal stairways.

While such designs are Gothic in character they are more and more exhibit-



Water and bell tower of the C. P. Kimball Company's building. The sprinkler tank is behind the clock and the belfry directly below that has a set of chimes consisting of four bells, used instead of a steam whistle for announcing the beginning and end of working hours.

George C. Nimmons, Architect, Chicago, Illinois.



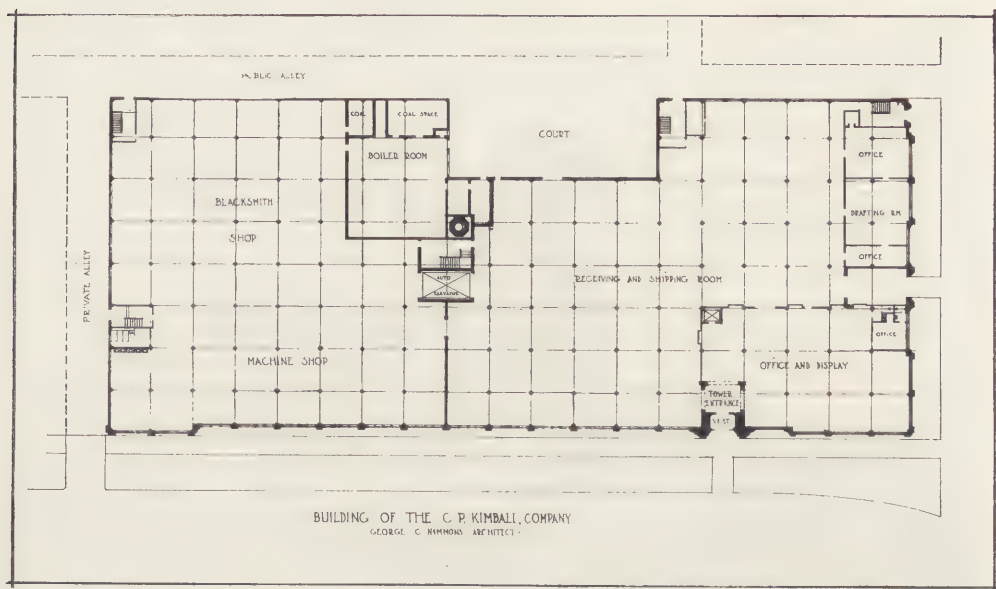
BUILDING FOR C. P. KIMBALL COMPANY, CHICAGO, ILLINOIS.

George C. Nimmons, Architect.

The architectural treatment intended to make this building interesting and attractive added only 5 per cent. more than the cost would have been to have built the building after the utilitarian design shown below, according to the contractors' estimate.



UTILITARIAN DESIGN MADE FOR THE C. P. KIMBALL COMPANY'S BUILDING BY THE ARCHITECT TO DETERMINE THE DIFFERENCE IN COST BETWEEN THIS EXTERIOR TREATMENT AND THE ONE SHOWN ABOVE, AFTER WHICH THE BUILDING WAS ACTUALLY BUILT.



ing a freedom and originality that promise in time to develop into a well-defined architectural style for American industrial buildings.

The landscaping of the grounds about an industrial plant has indeed become an important matter, especially since the need for playgrounds and breathing spaces for employees is being so generally recognized. Even if a plant only has a few feet of space as a foreground, it adds greatly to the good appearance of the whole establishment to plant this in grass, flowers, shrubbery or vines. Nothing will give any building of this sort so good a setting as a bit of planting around its base.

When a plant is to be built in the outlying districts of a city it is frequently possible to secure sufficient land for an

ample foreground and space for recreation and playgrounds. No better influence can be brought to bear upon the employees during their noon hour or recreation periods than that which is exerted by the presence of the flowers and green things of nature in the vicinity of their workshops. If it is necessary for the plant to have a reservoir of water for the sprinkler or fire-protection system, this sometimes may be made into a pond bordered with walks, trees, and flower beds and in this way made the dominating feature of a landscape plan, or the playgrounds for some outdoor game may form the center of a small park-like treatment that will add wonders to the attractiveness of the whole place and not infrequently exert an invaluable influence on the morale of the entire working force.



By
John Di Mariano





DRAWING BY JOHN DI MARIANO.



DRAWING BY JOHN DI MARIANO.



Old Colonial Doors
New York City

DRAWING BY JOHN DI MARIANO.



DRAWING BY JOHN DI MARIANO.



Broomse Street



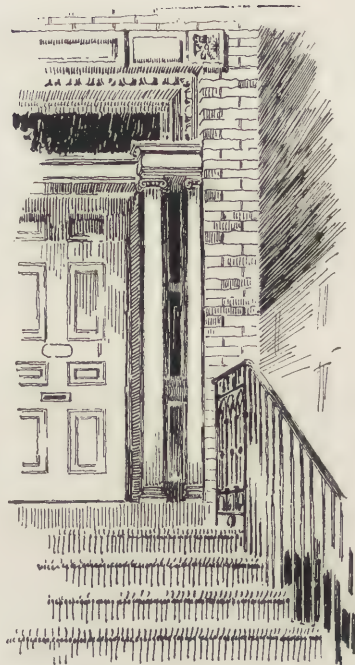
Limmanan 710

West Houston Street

Macdougal Street

Old Colonial Doors
New York City

DRAWING BY JOHN DI MARIANO.



Old Colonial Doors
New York City

DRAWING BY JOHN DI MARIANO.

PORTFOLIO
OF
CURRENT
ARCHITECTURE



WINTER HOME OF GEORGE H. CROSBY,
ESQ., MIRA VISTA, PASADENA, CAL.
J. CONSTANTINE HILLMAN, ARCHITECT.
(For text, see page 188.)



LIVING ROOM, LOOKING INTO DINING ROOM. WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL.
J. Constantine Hillman, Architect.



LIVING ROOM. WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL.
J. Constantine Hillman, Architect.

[illegible]

PLAN OF WINTER HOME OF GEORGE H. CROSBY, ESQ., MIRA VISTA, PASADENA, CAL. J. CONSTANTINE HILLMAN, ARCHITECT.



BED ROOM MANTEL—HOUSE OF J. M. R.
TYETH, ESQ., RIVERDALE-ON-HUDSON, NEW
YORK CITY. DWIGHT J. BAUM, ARCHITECT.



WAR BOOKS OF THE CATHEDRALS

By BARR FERREE

Part V.

A Record of Destruction

ONE of the earliest results of the cessation of the war will be an accurate disclosure of the damage done to buildings of historic and artistic merit in northern France. Not one book, but many, will be required to even briefly catalogue these horrors. Much has, indeed, already been published; but the systematic surveys, the careful observations of trained scholars, the results of official scrutiny, have now to come out. The task is a vast one, for the German invaders spread themselves over a large territory and destroyed thousands of monuments. A scientific account of this destruction is a work of immense magnitude. Not only must many buildings be described and their injuries noted, but in many cases whole cities and towns have been so nearly obliterated that everything they contained must be summarized and catalogued. Several years may well elapse before the full effect of the German horror can be accurately known.

The first considerable book to be published in France dealing with German destructiveness is *Les Monuments Français détruits par l'Allemagne*, by M.

Arsene Alexandre. It is dated 1918 and was printed at Nancy by its enterprising publishers after the sixteenth bombardment of that city by long-range guns, and the hundred and twentieth attack by aviators. Appearing before the signing of the armistice, it was written some time before and does not, therefore, summarize the colossal injuries of 1918. Amiens, for example, is not mentioned, but is referred to in a slip pasted onto the first page, in which mention is also made of the latest horrors at Reims. In a sense, therefore, the book appeared a little too soon, but as a record of wicked hate toward beautiful buildings it is so appalling as to give a German pause. The author is Inspecteur Général des Musées, and his book is an inquiry made by the direction of M. Albert Dalimier, Sous-Secrétaire d'État des Beaux-Arts. It may thus be regarded, in a sense, as an official publication of the French Government. M. Alexandre is the joint-author with M. Paul Ginisty of the admirable *Le Livre du Souvenir*, a traveler's guide to invaded France, published in 1916, and previously referred to in these notes.

The present book is a volume of two

hundred and eighteen pages, with forty-seven plates containing two hundred and forty-two reproductions of photographs. With a few exceptions all of these illustrations are of ruined buildings, many of them hardly more than formless masses of rubbish. They constitute the most terrible indictment of German ruthlessness toward buildings that has yet been made. Nothing escaped the mad passion of the invaders; no building was too magnificent, as the cathedral of Reims so eloquently testifies, or too insignificant, as many a picturesque little house now gone forever establishes, to escape destruction if their guns could reach it. M. Alexandre marshals the whole hideous array in due order, taking up his subject by departments, and then by cities and towns, noting the more essential injuries done in each instance. It is a veritable nightmare of evil, a thing so monstrous as to seem unreal, even with the photographic proof before one. And all this ruin was done, as the whole world now knows, without the smallest advantage to the destroying invaders. Down-right wickedness; that, and nothing else.

M. Alexandre opens his book with a study of the German mind and an examination of the German position with reference to destroyed monuments. He examines the arguments for Kultur and the German antagonism to the French. At the time these pages were written such topics may have had some interest; they have none now. No one any longer cares to study the German mind, for its practical results, as this book so eloquently shows, prove it to be unworthy of consideration. And Kultur and its pretensions now rank with such ineffectual curiosities as the Keely motor or the long since exploded moon hoax. What they thought, and why and how, is of no consequence whatever in the face of what they accomplished. For four years they did as much evil in the world as they could; M. Alexandre, with high official backing, can only summarize a part of it.

Notwithstanding the care with which this introductory chapter has been put together, and a very good piece of work it is, M. Alexandre himself would prob-

ably be the first to disclaim any importance for it. The great merit of his book is its systematic survey of the German ruination. This he has done as thoroughly as the conditions prevalent at the time of writing permitted. As the first comer in a field destined to be largely occupied, he has a real advantage, and, painful as his book is to read, because it deals with a most painful subject, it nevertheless merits a hearty welcome.

This book is an entirely new kind of architectural history. In the calm days that preceded the German eruption, an architectural history was a history of progress. The historian set out to trace the history of his subject from its earliest manifestation to its culmination. It is quite true that, to bring his story down to modern times, many a collapse and many a step backward had to be noted. But the Germans have brought about the need of writing a new kind of architectural history, a history of destructiveness, and of destructiveness in its most wanton phases. For the first time since books have been made has an author been able to prepare a stout volume on so interesting a subject as fine buildings, beautiful buildings, good useful and ornamental buildings, about which nothing is said but their destruction or injury.

Literally, of course, this is not true, for M. Alexandre briefly sketches the history of some of the more notable structures mentioned. But his theme is not upbuilding, but throwing down. If he feelingly describes the beautiful little church of Tracy-le-Val, it is only to refer the reader to his photograph showing it now to be a mere heap of stones. And, indeed, we are too painfully reminded that, were the early history of most of the buildings illustrated in this book fully known, it would be possible now to prepare a complete and final history of them; for many of them no longer exist. In too many cases they have been utterly swept away by the German guns, or unavoidably destroyed by necessary French bombardment; or they have been so gravely ruined as to be no longer returnable to their original condition.

Of the cathedral cities injured in the war mention is made of Arras, Lille,

Nancy, Reims, St. Dié, St. Omer, Senlis, Soissons, Toul and Verdun. The cathedrals of most of these places have been more or less injured, some very considerably so. The notes on Lille are summary only, for it was still in German hands when the book was written. The cathedrals of St. Omer and of Toul do not appear to have been injured. Amiens, Châlons-sur-Marne, Laon, Meaux and Paris are not mentioned.

It is, however, ungracious to find fault with M. Alexandre for not including in his book records of destruction wrought after it was written. It is the most extensive survey yet produced of German injuries in France. It is concerned not only with cathedrals and churches, but with civic buildings of all kinds. For many buildings of special note admirable sketches of their history are given, so that the most uninformed may know exactly what the world has lost. It is a book certain to fill the mind of any friendly reader with lasting regret that so much that was good and beautiful should have been so ruthlessly injured. And Germans, we may hope, may well feel undying shame for their own responsibility for this hideous ruin.

The cathedral of Reims is the most important French building to be seriously injured by the Germans. M. Alexandre gives several pages to it, presenting a brilliant sketch of its architectural history and noting such misfortunes as had happened at the time of writing his book. But as the Germans bombarded the cathedral to the very last day of their occupation of the vicinity, much happened later that he could not refer to. In this connection special interest attaches to an article on the actual state of Reims, published in the great French illustrated weekly, *L'Illustration*, of November 2, 1918. It is by M. Max Sainsaulieu, the architect of the cathedral. Nearly a hundred hectares of the area of the city is covered with buildings totally demolished, while all the others, he adds, are more or less bombarded. He briefly notes some of the more important structures that have been badly hurt, a grievous list. Much injury was done to the great abbey church of St. Remi. As

for the cathedral, it rises in an immense field of calcined walls.

M. Sainsaulieu notes the loss of many of the more important statues on the exterior of the cathedral, some of which have utterly disappeared. The beautiful statue of the "Beau Dieu" of Reims, the famous figure of the blessing Christ at the portal of the Last Judgment, has been decapitated. Many pinnacles and architectural parts of the exterior have disappeared, and some of the vaults have been pierced. That the great roof, with its magnificent ancient woodwork, had gone has been known from the days of the first great fire. But M. Sainsaulieu is not discouraged. The towers and the larger part of the structure remain firm and steadfast and he looks to a restoration that will bring the cathedral to its original splendor. Possibly this can be accomplished; meanwhile, it is good to have the opinion of so competent a judge on this highly important point.

THE MEANING OF ARCHITECTURE

HERE at last is a book on architecture* that is not solely concerned with the relics of a dead past, but has something to say of the living present and of that future whose birthpangs we are shortly to endure. It treats of architecture as an art of expression, not as a book of fashions or a bag of tricks.

Architecture is the expression of the psychology of a people, a record of their thoughts, their tastes—even their hopes, their dreams. But according to Mr. Pond it is more than this. A work of architectural art is primarily an expression of itself—the inner nature of its own becoming; a dramatization of those invisible physical forces which both maintain and menace it.

To the extent that architecture becomes thus expressive and dramatic, it enters into relation with human life, and becomes expressive of that also, for the reason that the physical forces which de-

*The Meaning of Architecture. By Irving K. Pond. Boston: Marshall Jones Company. Price \$2.

termine structure have their correlatives in those obscure mental and psychic impulses and inhibitions which mould and modify character, and so determine destiny.

The manner in which Mr. Pond establishes and illustrates this thesis is more than ingenious. It would be unfair both to him and the reader to attempt to summarize his argument within the limits of a brief review, but in general he identifies that rising and resisting force which finds expression in the column with the will-to-live, to adventure, to achieve; while that Nemesis which says to man "thus far shalt thou go and no farther" he finds symbolized in the horizontal entablature—fate as opposed to freedom. The "conflict" between these two, and their beautiful reconciliation find expression, at the hands of the artist, in those diverse forms and ornaments which mainly characterize the so-called historic styles. In these forms and ornaments Mr. Pond finds appropriately and variously symbolized the forces of compression and tension actually operative within the structure—they tell what is "happening" there. And from the larger, philosophic view, they tell also of those psychic forces which press and pull, urge and arrest us throughout a life which, like a church or a temple, may be made to show forth an admirable adjustment of effort ending in exquisite acquiescence.

Such a view of "the meaning of architecture" is an incentive to new achievement, for it vitalizes and humanizes an austere art, and contradicts the vicious teaching which is numbing the brains of so many pupils in architectural schools—a teaching which is summed up in the phrase "All we can do is to study and re-study, to refine and re-refine the elements left us by the past."

Not so Mr. Pond: "Dramatize, dramatize!" is his more heartening message to the eager spirit of youth. He urges us to discover the right dramatic expression for the forces which play through the frame of a modern sky-

scraper, and the correlative forces at play in modern American life, that architecture may again become a living art. He does not minimize the difficulties, and that it is a task impossible of accomplishment by any single individual he is particular to state. His own attempts to apply his metaphysic to modern problems enforce this truth, and give point to Schopenhauer's dictum that "the concept is unfruitful in art." If we compare Mr. Pond's skyscraper sketch with the somewhat similar Woolworth building tower, it is clear that the author of that beautiful obelisk "followed the rules without knowing them" more effectively than Mr. Pond with all his knowledge; and however accurately his ornament may express the play of concealed forces, it is far less beautiful than that developed by Mr. Louis Sullivan, for example, and by so much less truly representative of the *elan vital*.

For "Beauty is truth; truth, beauty," and if anywhere a beauty is discovered which refuses to submit itself to Mr. Pond's or anyone else's formula, we may be sure that there is some larger synthesis which includes it too.

The Meaning of Architecture is a book into which the author has poured out his mind and his heart. To books of this order justice is never done by an exercise of the mere critical faculty. One might say that Mr. Pond's style, both in writing and drawing, is singularly lacking in charm; that he is intolerant of points of view and methods of work at variance with his own: even at times exhibiting a certain truculence toward others, sincere as himself, who follow a different dream. But it is better to let such thoughts submerge themselves in a great gratitude that a sincere, strong, thoughtful spirit has spoken words of truth, encouragement and wisdom to those who, in quest of architectural beauty, follow a long and dusty road, lined with the ruins of ancient grandeurs, leading they know not where.

CLAUDE BRAGDON.



- Thirty-sixth Annual Catalog of the University of South Dakota 1917-18. Announcements for the year 1918-1919. 286 p., 7¾ by 5 inches. Published by the University, Vermillion, South Dakota.
- Lessons on Form. A Manual of Free-Hand Drawing. By A. Blunck, Architect. Revised American Edition, 104 pages of drawings, 20 p. text, 12 by 9 inches. Cleveland: J. H. Jansen. Price \$3.00.
- Heating and Ventilation. By John R. Allen and J. H. Walker. Many ills., 305 p., 9½ by 6 inches. New York: McGraw-Hill Book Co., Inc. Price \$3.00 net.
- The Johns Hopkins University Circular. Announcements for 1917-1918. Edited by Thomas R. Ball. 408 p., 9 by 6 inches. Published by the University, Baltimore, Md.
- Fuel Economy in the Operation of Hand Fired Power Plants. Many ills., 94 p., 9 by 6 inches. Published by the University of Illinois, Urbana. Price 20c. per copy. European Agent, Chapman & Hall, Ltd., London.
- University of Oregon Bulletin, School of Architecture and Allied Arts. Many ills., 43 p., 9 by 6 inches. Published by the University of Oregon, Eugene.
- Silk and Manufacturers of Silk. Schedule L. 163 p., 9 by 6 inches. Washington: The Government Printing Office. (United States Tariff Commission—Tariff Information Series No. 3.)
- United States Tariff Commission. Outline of Its Work and Plans. 13 p., 9 by 6 inches. Washington: The Government Printing Office.
- The Vermont Bulletin Catalogue Number 1917-1918. The University of Vermont and State Agricultural College Announcements for 1918-1919. 211 p., 5 by 7½ inches. Published by the University of Vermont, Burlington.
- As a Man Liveth. Published by the Associated Metal Lath Manufacturers. Many ills., 31 p., 8¾ by 11¼ inches. Cleveland: Associated Metal Lath Mfrs. Price \$1.00.
- American Journal of Archaeology. Second Series. The Journal of the Archaeological Institute of America. Issued Quarterly. Many ills., 250 p., 9½ by 6 inches. New York: The MacMillan Company.
- The Bulletin of the Pennsylvania Department of Labor and Industry. A Bulletin of Information for the Public. Volume V. Series of 1918. No. 1. 176 p., 9 by 6 inches. Harrisburg, Pa.: J. L. Kuhn.
- Fire Waste in Canada. By J. Grove Smith. Ills., 319 p., 10 by 7 inches. Ottawa: The Commission of Conservation. Price 50c.
- University of Wyoming Bulletin. Issued by the University of Wyoming. 259 p., 5¼ by 8 inches. Laramie, Wyoming.
- Columbia University Bulletin of Information. Catalogue, 1917-1918. 442 p., 6 by 9 inches. New York City: Columbia University.
- Teton Sioux Music. By Frances Densmore. Smithsonian Institution Bureau of American Ethnology Bulletin 61. Many ills., 561 p., 9½ by 6¼ inches. Washington: Government Printing Office.
- The Studio Year Book of Decorative Art. A Review of the Latest Developments in the Artistic Construction, Decoration and Furnishing of the House, 1918. Many ills., 96 p., 8½ by 12 inches. New York: John Lane Company.
- A Directory of Engineers, giving a brief synopsis of the experience and training of each of the members of the Association, 6 by 9 inches, 192 p. \$2.00. Classified tables have been compiled based on experience, so that it is possible to find a consulting engineer, an executive or a subordinate having specific experience and living in any definite locality. Thus if one needs a consulting hydraulic engineer, or a designer of machine parts, he is able to find men having this experience through the aid of the classified tables.
- Concrete Stone Manufacture. By Harvey Whipple. Second Edition Revised and Enlarged. Many ills., 318 p., 7 by 5 inches. Detroit: Concrete-Cement Age Publishing Co.
- University of Illinois Bulletin. Tests to Determine the Rigidity of Riveted Joints of Steel Structures. By Wilbur M. Wilson and Herbert F. Moore. Bulletin No. 104. Ills., 60 p., 6x9 inches. Published by the University of Illinois, Urbana.
- Loan Exhibition of Tapestries, Assembled, Arranged and Catalogued by George Leland Hunter. 28 p., 6 by 9 inches. The Cleveland Museum of Art, October 5 to November 17, inclusive.
- Storing. Its Economic Aspects and Proper Methods. By H. B. Twyford. Illustrations, 196 p., 9½ by 6 inches. New York: D. Van Nostrand Co.



**The Sunken
Garden in
Brackenridge
Park, San
Antonio,
Texas**

It is always refreshing to discover a piece of work which shows the touch of inspiration, and it is especially gratifying to find that quality in municipal improvements. We rather expect stereotyped ideas in public works because of the omnipresent politician and of the many unavoidable limitations imposed by city conditions. Even in cities, however, there are often irregularities of topography which offer opportunities for interesting development. All too frequently these possibilities are not recognized, but instead some pre-conceived scheme is chosen (borrowed probably from some spot where entirely different conditions obtain), hollows are filled, hills cut away, and in the end most of the natural charm is destroyed and an artificial "effect" produced.

A rare exception to this rule and a remarkable example of intelligent adaptation of design to existing conditions is a most beautiful little garden which forms a feature of one of the parks of San Antonio, Texas. An old stone quarry, containing a miscellaneous assortment of tin cans and other evidences of civilization, disfigured a corner of Brackenridge Park, and in the ordinary course of events would have served as a city dump until level full. But fate placed a man of vision in the office of Park Commissioner, Mr. Ray Lambert, who had as adviser Mr. F. F. Collins, an enthusiast on the subject of city planning and creator of the famous Collins Gardens.

War conditions had cut down the Park Commissioner's force of men and the funds at his disposal, but he had seen his opportunity and that was sufficient. The man who had formerly worked the old quarry was induced to contribute a supply of ce-

ment, laborers were borrowed from the various city parks, a small gang of prisoners was commandeered from the jail, and with nothing to work from but a mental picture and a few stray photographs of Japanese gardens and tea houses, he started in.

The rubbish was cleared away, pools were dug in the quarry bottom, islands and bridges were built of the loose stone,



CORNER OF THE SUNKEN GARDEN, BRACKEN-
RIDGE PARK, SAN ANTONIO, TEXAS.



CONNECTING POOLS IN THE SUNKEN GARDEN, BRACKENRIDGE PARK, SAN ANTONIO.

paths were cut into the surrounding walls, and rich soil was brought in for flower beds. At one side a curious pavilion was built, partly upon the bank and partly overhanging the water of the pool below, from which two of its massive rough stone columns tower to the roof of palm leaves.

One approaches the garden along an "Alpine Drive" skirting the edge of the encircling cliff, and scrambles down into it by tortuous pathways which branch out to all parts of it in the most unexpected manner. Down the precipitous walls, around the edges of the lily-strewn pools and across the fascinating little arched bridges they lure one on with scarcely

weird pocketful of loveliness, lighted apparently by large fireflies, the contrast with the city park on one side and the mesquite waste on the other produces an eerie feeling that lingers long about one.

For some reason photographs fail to show the beauty of the place. They lack the atmosphere, they lack the color, they do not convey the sense of seclusion produced by the high protecting walls of ragged stone; above all they cannot convey to the mind of the absentee the striking contrast between the daintiness of this Lilliputian garden and the vastness of the Texan plain which forms its setting.

I. T. FRARY.



JAPANESE MOTIFS IN THE SUNKEN GARDEN, BRACKENRIDGE PARK, SAN ANTONIO.



THE SUNKEN GARDEN IN BRACKENRIDGE PARK, SAN ANTONIO, TEXAS.

**Early
American
Country
Churches.**

On a trip through southern New Hampshire and Vermont I gleaned the accompanying snapshots of a group of interesting Colonial churches. They are in marked contrast with those seen on a Western trip, none of the latter comparing in beauty or dignity with the least pretentious of these.

The church at South Acworth, New Hampshire, was built in the period that came under Gothic influence, the early part of the nineteenth century. Alterations have been made, destroying the symmetry of the façade, but leaving the simple Colonial outline and the white spire.

The Gothic in this church extended only to the window heads and to the detail around the base of the spire. The general outline remained Colonial, although the detail of the corner boards was affected



CHURCH AT SOUTH
ACWORTH, N. H.

by the Greek revival. There is a queer jumble of styles, but the whole effect was not marred; the building retains the character of the "white church."

The church at Fitzwilliam has been made over into a town hall, but the fine spire is being preserved. The number of people passing in and out of a weekday rather startles one at first sight.

It is unfortunate that the country churches being built throughout the West cannot take the best of these Colonial churches as models rather than the non-descript styles that have been so popular recently.

FRANK A. BOURNE.

**A Winter
Residence in
Southern
California.**

Not many years ago the district known as Mira Vista was added to the corporate limits of Pasadena, the famous winter residence town of Southern California.

It is on the west of the Arroyo Secco and north of the new Linda Vista Bridge, which crosses the Arroyo. It runs along the base of a range of hills, several hundred feet high, which extends from the new Colorado Street concrete bridge northward to the Devil's Gate. A well improved road follows the foot of the range, intersecting the roads that focus at the Devil's Gate, the gateway of the mountain district to the northwest. From this range lovers of beautiful scenery command a view over the Arroyo Secco toward the most beautiful suburban section of Pasa-



CHURCH AT WEST RINDGE,
N. H.



M. E. CHURCH AT TOWNSEND,
MASS.



CHURCH AT ACWORTH,
N. H.

dena, to the east; to the northwest lies Altadena, behind which rise the mountains of the Sierra Madre range, of which Mount Lowe and Mount Wilson are known to all travelers; to the east of the range, eighty miles away, "Old Baldy" towers, snow-capped during half of the year. Toward the southeast the view across the Arroyo takes in Brookside Park, in the valley.

Buildings on the west side of the road overlook those on the lower east side. Sites on the west side literally have to be dug into the hill.

Such was the site selected by George H. Crosby, of Duluth, Minnesota, and turned over for development to J. Constantine Hillman, architect, of Pasadena. His main instruction to the architect was that the view from the house must be preserved and utilized. The perspective photograph tells the result quite graphically. There you can see the wild uncultivated hill and part of the bank of still uncultivated earth behind the house not yet overgrown by vines, as it will be. The great problem for the architect, with a cross section of the ground before him, was to decide upon a finished section that would put the house at the proper elevation from the road, so that it could have a basement underground and a first story approach with terraces, which might afford entrance by short flights of steps and still make it possible to have a garden under the brow of the hill. It was also necessary to provide a stairway to the service end of the house and to have a basement entrance. A garage had to be built at the north end of the site, placing it on the street level and surrounding it on three sides with a heavy concrete retaining wall. The two terraces, parallel with the street, abut on this wall. The concrete roof of the garage is near the level of the narrow lawn and garden which surround the house, the garden being carried over the garage, where it is surrounded by a balustrade with pedestals, similar to those seen on the south of the house.

Everything in the general arrangement finally carried out is subservient to the necessity for preserving the views from the house as well as the views of the house.

The house itself is quite small, yet it provides for every comfort and convenience that could be desired. But, above all, it is planned and built to give prominence to the superb pictures that are framed by the five windows in the two

main rooms of the first story. Some suggestion of the window views may be obtained from the illustrations of the living room and the dining room.

It might be said in criticism that placing so many large immovable plate glass windows is not wise in a hot climate. But that falls when it is remembered that this is a winter residence and is built to be occupied only five months in the year.

The exterior design of the house was the subject of much thought on the part of Mr. Hillman. All the terraces and stairways are finished in concrete. The house is of frame construction, the first story being finished on the outside with cement plaster on galvanized steel lathing. The second story is an example of rational wood construction, carried out in red-wood and oiled. Mr. Hillman said he could not feel satisfied with his design for a red-wood second story and roof on top of a white first story until he had added the four buttresses at the corners, which look much like chimneys. They are ornaments used solely for an esthetic purpose and are slightly battered, with a curved profile in the first story. The three latticed sleeping porches on the second story are interesting additions to the house.

PETER B. WIGHT.

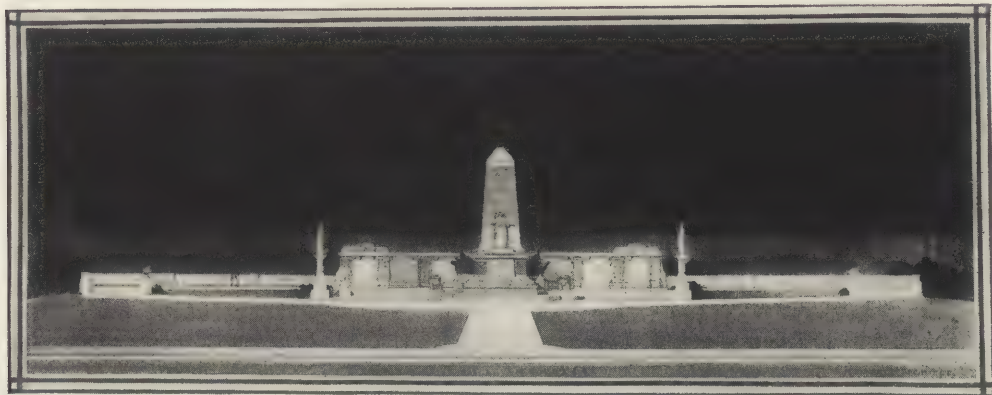
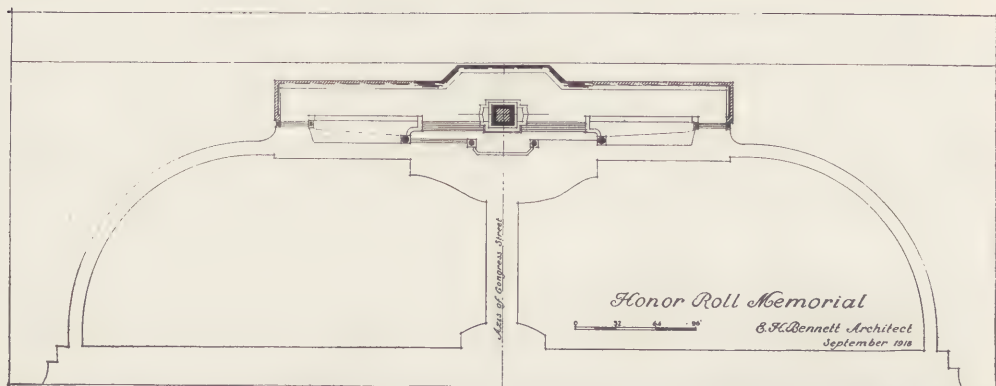
A Proposed War Memorial

Plans have been drawn for the erection of an Honor Roll Memorial to Chicago men who have lost their lives in the service. It is designed to carry their names and is in the truest sense a Dedictory Monument, one which symbolizes the dedication of an entire city to the purpose of winning the war, as it was realized that a complete memorial could be erected only after the close of hostilities. That point has now been reached and it is probable that a permanent memorial will take its place.

The site selected was the Lake Front, on the center line of the layout of Grant Park and of the downtown center of Chicago—Congress Street. The plan was promoted by the following committee:

Alderman Joseph O. Kostner, Chairman; Mrs. Heaton Owsley, Mr. Charles L. Hutchinson, Mr. Frank Logan, Mr. Charles H. Wacker, Mr. Pompeo Coppini, Col. Nathan W. MacChesney, Mr. J. E. Williams, and Mr. E. H. Bennett, architect.

It was understood that the sculpture would be done by members of the Western



Society of Sculptors. It was proposed to execute the work in staff as a temporary monument and owing to the approach of winter very limited time was available for the design.

In connection with this matter full acknowledgment is made of the invaluable collaboration of Mr. Earl H. Reed, Jr., and Mr. Edmund S. Campbell, architects of Chicago, in this design.

EDWARD H. BENNETT.

A Proposed War Memorial At San Francisco

Mr. Willis Polk urges the adoption by San Francisco of an idea proposed by the Art Association for a survey of the metropolitan area, a plan of which is outlined in the following report of a meeting in San Francisco to discuss the question:

A National War Heroes Memorial is already a local project in many cities, villages and hamlets the world over.

In many instances this movement only comprehends a temporary triumphal arch

of welcome to returning soldiers, to be later constructed in permanent form as a memorial to the heroic dead.

Some of these projects will undoubtedly be carried through, most of them probably will be hastily conceived, poorly executed, and represent nothing but a spontaneous desire to pay tribute to the valient crusaders who died that democratic freedom throughout the world might prevail.

San Francisco has announced that she will contribute her portion to this concrete demonstration of a world's appreciation. Since she has said so, she will do it! That she will try to do it right cannot be questioned. Will she be deliberate enough to do it best?

The Art Association, so that such a memorial may be a perpetual inspiration to all who strive for high ideals, proposes that it take the form of a comprehensive survey of the entire metropolitan district covering the city and bay communities, upon which not only present but all future developments of this territory be planned. Small ideals of the present would be but details in such a plan.

A great plan, for a great future, along

artistic as well as economic and practical lines is proposed. This, indeed, would be a memorial of truly magnificent proportions! We must do it.

To do it there must be instituted an office in which a few young men and women would take up a serious study of all phases of the problem, under direction of a board composed, among others, of a number of architects, painters and sculptors. At stated intervals (once each month would be often enough) this board should review, in a spirit of academic criticism, the work of the students.

Under such a scheme community service could be organized, community spirit crystallized, and community thought analyzed and concentrated. In other words—with the will, and with the spirit to do the best for our community, we ought to get the best.

This may sound chimerical and in the category of dreams, but, after all, what is the work of big men but dreams come true!

If the Art Association will take the lead in this matter the big men of this community will back it up. 'Tis only the little man that hesitates; 'tis only the timid man that fails.

You hear much at this time of after-the-war-business-conditions. An indefinable dread of the Bolshevik, the I. W. W. and the revolutionist is in the air. But, never fear—such revolutionists are but feeble-minded children—the war itself has been the greatest revolution in history. A revolution against autocracy, tyranny and Kaiserism. The revolution has succeeded. The world is free. Long live the revolution!

Therefore, Be It Resolved, That it is the sense of this meeting that the consideration of the proposed memorial be taken up by the San Francisco Art Association along the lines above set forth, and

Be It Further Resolved, That the Mayor and Board of Supervisors, and others interested, be requested to collaborate with the Art Association toward the consummation of this plan.

In this way the projects of all will receive the highest artistic consideration—the destiny of a people, the fame of a city, must ever be inseparably coupled with Beauty.

San Franciscans know this. Citizens—do your duty!

Athens, Venice, Paris, Washington. Next?

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make

big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty."—Daniel H. Burnham.

WILLIS POLK.

Suggestions Regarding Treatment of War Memorials

The American Federation of Arts in response to requests and in the hope of assisting those throughout the country who are desirous of securing memorials, which in form and character will appropriately commemorate those in whose honor they will be erected, have issued the following circular:

WAR MEMORIALS:

Suggestions for Their Treatment.

In response to requests for advice from different quarters, the following suggestions are offered to those who are considering the erection of war memorials:

(1) Consider the amount of money probably available. Conclusion on this point must necessarily precede any determination as to the form of memorial, and is equally important whether that form be some structure, architectural or sculptural, painting or work of landscape art.

(2) Consider tentatively the form which the memorial should preferably take, whether architectural or sculptural, a painting or some kind of landscape art.

(3) Also the question of site. This question is of vital importance. In large towns the memorial if monumental should not be so placed as to obstruct traffic and at the same time should be in a position sufficiently conspicuous to be worthy of its object. Existent buildings and other surroundings should be considered in deciding location. So should also the permanence of such buildings and surroundings. This is quite as important in the case of a small village as in a large town or city.

(4) Likewise in connection with any structure the question of material, whether stone, marble or bronze. Local stone has advantages, both economically and sentimentally.

(5) The approaches to any memorial and the points of view from which it is

seen are quite as important as its immediate surroundings.

(6) The cost of laying out the site, when necessary, should be included in the scheme. The effect of a memorial is often entirely lost by lack of a careful laying out of the site.

(7) Where memorials are proposed for the interior of buildings, whether in sculpture, architecture, stained glass, mural paintings or wall tablets, careful regard should be paid to the scale and character of the architecture of the building and to any adjacent monuments.

(8) The lettering of all inscriptions should be carefully studied and should be legible. A bold Roman type, or the Italian lettering of the sixteenth century based on it, is the type most suitable.

(9) In all memorials simplicity, scale and proportion should be aimed at rather than profusion of detail or excessive costliness of material. It is the artistic, imaginative and intellectual quality of the work that gives it its final value.

(10) Before the adoption of tentative plans, and preferably before any plans are made, secure expert advice. This can usually be best obtained by calling in a competent artist, be he an architect, a sculptor, a painter or a landscape architect. If there is to be a competition, careful specifications setting forth the terms of the competition should precede it. It should be remembered that the ablest artists are not usually willing to enter competitions except for structures of the most important kind.

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The American Federation of Arts has determined to make war memorials one of the chief subjects of its annual convention, which is to be held at the Metropolitan Museum of Art in New York in the month of May, 1919. It expects to hold at the same time an exhibition of existing war memorials which have been erected in the past in Europe and America and which will be suggestive not only for cities but equally for country villages. Meanwhile a special advisory committee of experts whose services can be placed at the call of those throughout the United States who are considering the erection of war memorials is to be appointed.

Pending the announcement of the personnel of this special advisory committee requests for suggestions and further advice may be forwarded to the Secretary, The American Federation of Arts, 1741 New York Avenue, Washington, D. C.

A Correction

In the December issue of the Architectural Record a view was shown of the garden of the estate of the Hon. George B. Agnew, South Salem, New York, in connection

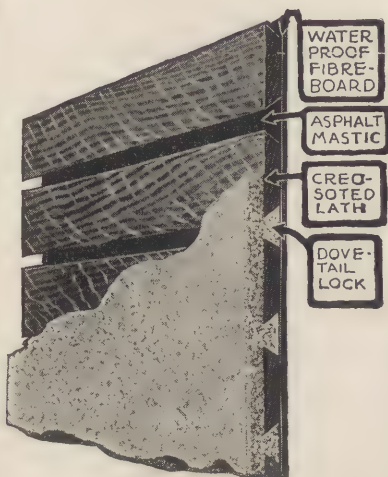
with which the name of William Adams was mentioned as architect. Due credit for the designing and superintending of the garden on this estate should have been given to Mr. Charles D. Lay, of Lay & Wheelright, New York.

THE ARCHITECTURAL RECORD

March 1919



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AMONG them are nationally known firms who do not compromise on doubtful construction; state architects; architects of schools, churches, clubs, public buildings, fine residences and popularly-priced homes.

The use of Bishopric Board for Stucco construction has increased 1000 per cent in six years. For these reasons: Wherever the right Stucco mixture has been applied to a Bishopric background the walls have remained rigidly intact—crackless, unsagging; there has been no rusting—no pulling away from the supports—because first, there is nothing in Bishopric Board to

disintegrate; and second, it is nailed securely to studding or sheathing; it provides effective insulation; deadens sound; and often the saving it makes possible solves an economic problem for Architect and Builder.



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Stucco clings vise-tight to the dovetailed, heavy-wood strips which are creosoted against swelling, shrinking, warping, and weather change. Nailed as a unit to the building with joints broken every four feet for added rigidity, with the proper mixture of stucco applied to Bishopric Board, the walls cannot crack or crumble or the building be anything but comfortable, well-insulated, and sound free.

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Bishopric Sheathing saves about 40 per cent as compared with 7/8-inch wood sheathing. Makes a compact, damp-proof, sound-proof wall. No joints or knot holes.

Note the absolute rigidity of construction of this 3-family apartment house in Utica, N. Y., built for John J. Doyle. This building stood through the winter before being stuccoed. Bishopric Board was nailed direct to studding, no wood sheathing being used.

All Architects and Builders should have our book, "Built on the Wisdom of the Ages." It describes and details the use of Bishopric Board; illustrates homes and institutions on which it has been used; tells how to get perfect Stucco work. It contains reports of scientific tests and letters from engineers, architects, builders and home owners. Get it—and samples of Bishopric Board and Bishopric Sheathing.



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COURTYARD OF THE RESIDENCE OF MRS. ANDREW
WELCH, SAN FRANCISCO, CAL. WILLIS POLK &
CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



Detail of balcony. An excellent example of Leo Lentelli's technique.

***The* RESIDENCE of M^{RS}. ANDREW WELCH
SAN FRANCISCO, CALIFORNIA
WILLIS POLK & CO., ARCHITECTS**



By Leon V. Solon

THE ARCHITECT'S CONTROL IN COLLABORATIVE WORK.

IN THIS house we find a test of that theory, so dear to the associate painter or sculptor, that the artist contributing a major accessory should be accorded complete freedom, within structural limitations, to conceive and execute as he deems fitting.

The central court of this residence is the subject of the experiment. The Casa de Zaporta, formerly of Zarragossa (now re-erected in Paris), is its model. This masterly example of Hispanic Renaissance architecture supplied both the structural skeleton and the disposition of ornamentation, which Mr. Willis Polk, architect, of San Francisco, entrusted to the accomplished sculptor, M. Leo Lentelli, to rejuvenate. M. Lentelli was given complete freedom to indulge in any imaginative luxuriance he might contrive that would conform to the ornamental plan existing in the court of the Infanta's house. The extent to which such a policy is safe and advisable, from the architect's standpoint, is a subject for weighty consideration.

A basic difference in scenic function exists between the individual piece of sculpture, and one that is carved to occupy a definite position in an architectural composition. The individual sculptural object is created and executed with the assumption that it will be viewed and judged at a certain distance, at which there will be no distortion through unforeseen angles of vision, and from which detail will be neither too insistent through proximity, nor effaced by distance.

The sculptured item in the architectural scheme differs in this essential, that it must be equally efficacious at an additional range of vision. It should possess such intrinsic merit that its existence is justified irrespective of association: this might be termed its "short range" effectiveness. Its "long range" effectiveness exacts surrender of identity, at that distance whence a unit of effect results from the amalgamation of contributory elements.

To each complete view of an edifice there is a *focal point* at which all optical



DETAIL OF BALCONY, RESIDENCE OF MRS.
ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS
POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.

conditions operate to its scenic advantage. From that position the relative and mutual importance of integral points is adjusted, free from the distortion produced by an inordinately high picture-plane in too near proximity; from there, masses of ornamentation become reduced to a mere enrichment of surface areas.

The great Spanish architects of the sixteenth century enjoyed in exceptional degree the gift of subordinating ornamentation. Their sculptured embellishment, which at "short range" was often of exotic luxuriance, when viewed from the focal point, reduces itself to comparative insignificance in its unassertiveness. The magnificent portal of the Hospital Real, Santiago de Compostela, of the early sixteenth century, contains much carving that is an illuminating example of this particular quality. In that great work we encounter boundless variety and freedom in figure and ornamentation, both in its imaginative quality and in technique; but all is conceived primarily with the aim that a figure, for instance, will become an unobtrusive incident in a frieze of figures, whatever its individual interest or sculptural merit; or, if it decorate a niche, it will so combine with its frame and conform with its companions, that the grouping of the niches in the eye will be aided by the equation in scenic value of each. Thus, by the homogeneity of its units, the group in turn becomes a complete and cohesive member in the great scheme. Throughout that intricate composition there is a wonderful adjustment of scale in the detail and in the degree of projection for the various carved ornamentations. There is no one type of member or item in the composition that tends to amalgamate or pair itself through similarity of treatment with any other with which it has no direct relation, thereby risking disturbance to balance in the major scheme.

The aim of these great architects appears to have been variety in the decorative elements, homogeneity in the ingredients of the group, and an individual decorative quality for each of certain members, which was attained by contrasting their sculptural treatments and carefully calculating ornamental dis-

tribution; finally, simple unity in ultimate result, whatever the intricacy of the component parts.

The façade of the University of Salamanca is another typical example, characteristic of the manner of that period; numbers of other edifices might be cited, not omitting the *Caza de Zaporta*, as the one most in point.

This masterpiece reveals to a remarkable extent the Hispanic gift for contriving ornamental variation without destroying similarity of mass in repeating or balancing items; it also shows us decorated areas so governed in their treatment and disposition that when viewed from the focal point they assume a tone or texture quality, by means of contrasting scale of ornamental motif. This tone quality is the aggregate effect of embossed design; it is used by the sixteenth century Spaniards as a means for separating or grouping architectural items. It is effected by subjecting the ornamentation, embroidering each item, to a rigid equation of decorative value, through careful regulation of its scale, massing and projection. The exceptional skill with which this adjustment is made constitutes one of the most conspicuous physical peculiarities of the Spanish manner of that period, which cannot be overlooked in any modern stylistic essay without a serious depreciation of quality.

The temperament of the artist usually determines whether the field for inspiration will serve for anchorage, or point of departure. Choice abounds; the original model will render service to the brain or to the hand of the architect, proportionately as he may be imaginative or literal; abstract properties exerting the major influence on the former type of man, and the mechanical on the latter.

In the Welch residence we have to consider a rendering of a classic after the literal manner. Though the paraphrase of detail does not rank high in the estimating of imaginative evolutions of an idea, it is, in actual fact, the most daring of undertakings; inasmuch as the creation of direct substitutes is a challenge to the original, on its own ground. A clear conception of the exact contribution made by



DETAIL OF DOORWAY LEADING OUT OF COURTYARD, RESI-
DENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL.
WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.

each mass of light and shadow to an architectonic effect, is the first essential for a successful issue.

From the point of view of technique, M. Lentelli has contrived each item with his habitual skill and grace. As individual pieces of modeling, there are many that delight the eye; but as contributory elements to an architectural unit of effect they lack the "long range" quality. From the focal point, the items that figure on repeating members do not develop architectural uniformity and symmetry, as they lose their individuality through distance. This is conspicuously the case in the medallions and the alternating figures in the balcony. There is in M. Lentelli's treatment a certain raggedness of light and shade in these medallions which is disturbing and lacks the reposeful dignity of the originals. In the balcony of the *Caza de Zaporta* these details are treated with half figures framed in circular mouldings, which are very varied in subject and treatment, but which acquire an equation of decorative value as distance absorbs them in the main scheme. Subject and detail have been subordinated there in each panel to one aim, namely, that light shall fall and shadow be projected in equivalent masses and corresponding locations; the initial and ultimate aim having been that the maximum variation of detail should underlie an undisturbed architectural regularity.

This vital architectonic quality has not been appreciated in M. Lentelli's free and ingenious paraphrase; while according him all due credit for his dexterous exposition of the modern Italian manner, we feel that his work would have carried greater weight had collaboration with an architect existed; by this means broader unity in final effect might have been attained by a closer interrelation of integral parts. One of the great charms in the prototype is its expression of decorative stability, a sense in which the new version is deficient.

A criticism of similar character applies to the frieze of children below the balcony, which is restless, and appears to undermine the superimposed members. Indulging the privilege of comparison invited by a paraphrase, the corresponding

member in the *Caza de Zaporta* is a good example of decorative resourcefulness. The artist designing the original felt, as evidently M. Lentelli did, that the comparative proximity of this member to the eye demanded a degree of freedom in design; he consequently made an unusual compromise between the regularity of the recurring motif, and the irregularity of the free-running subject. The original gryphon motif is sometimes repeated, sometimes reversed, with occasional sections of free composition inserted with an amusing capriciousness, giving an impression of syncopated rhythm, punctuated at regular intervals by the repeating paterae, but conveying to the eye the impression of a uniformly decorated band of architectural ornamentation.

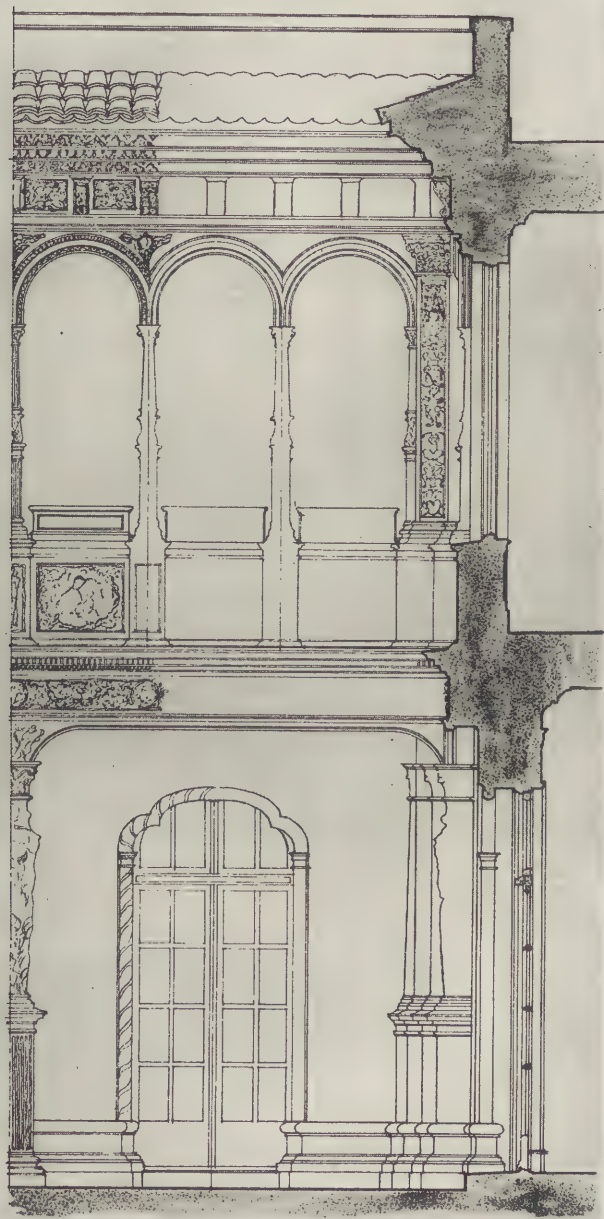
A careful examination of the detail of secondary importance fails to find much evidence of any inherent sympathy with architectonic ideals and aims; this sympathy should be an instinct of the architectural sculptor, curbing fancy to a rigid planning of motif. As an instance of this we note the spandrels over the caryatids in the *Caza de Zaporta* decorated with an extremely simple and symmetrical bird, arranged with outstretched wings (possibly the emblem of the Holy Ghost). The apparent strength of an important structural unit must not be impaired; for this reason, the silhouette of the bird follows the contour of this block, accentuating its form. In place of the bird M. Lentelli has chosen a knight on a prancing charger—the antithesis of the severe triangular bird motif. The concentrated vigor of the equestrian composition would be admirable in a spandril between arches, but is very detrimental to the sense of support essential here. The qualities we seek, and miss, are architectonic rather than sculptural. The capacity to appraise the scenic value of accessory sculpture must have been an important part of the craftsman training of both sculptor and architect from ancient times, down to the eighteenth century; such unvarying adjustment of values cannot be the result of hazard. Today this factor appears to have only a secondary importance; it is observed with little



THE COURT, WITH ONE OF THE GALLERY WINDOWS, RESI-
DENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL.
WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



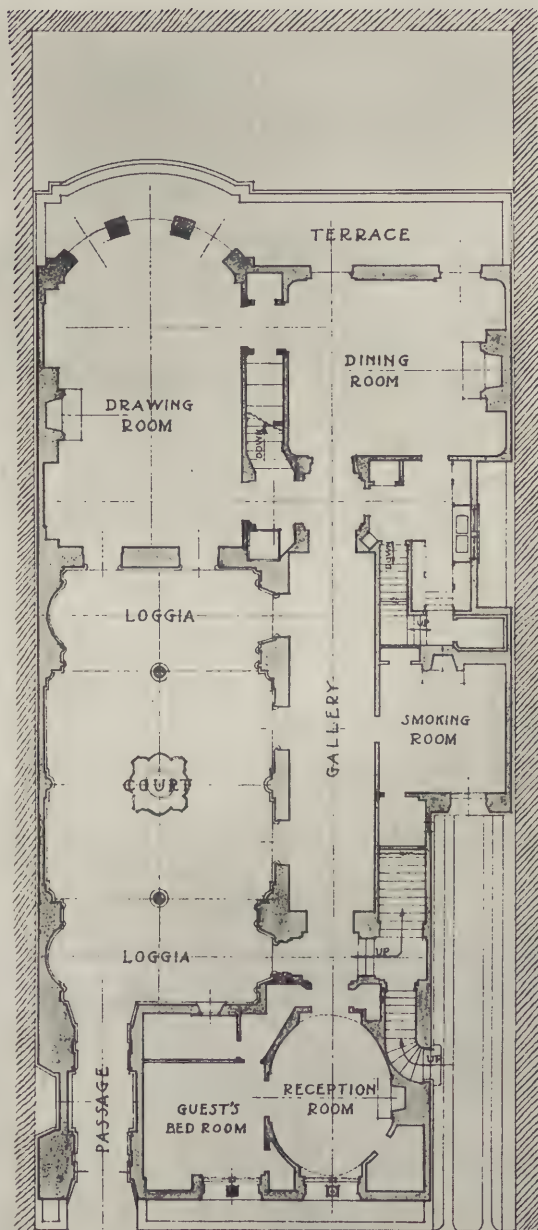
RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL.
WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



ONE HALF ELEVATION OF COURT

SCALE  FEET.

DETAIL OF COURTYARD DESIGN, RESIDENCE OF MRS.
ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS
POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



FIRST FLOOR PLAN
SCALE 1" = 1 FEET.

FIRST FLOOR PLAN, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



IRON GRILLE, RESIDENCE OF MRS. ANDREW
WELCH, SAN FRANCISCO, CAL. WILLIS POLK &
CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



THE COURT, RESIDENCE OF MRS. ANDREW
WELCH, SAN FRANCISCO, CAL. WILLIS POLK &
CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



THE WINDOWS OF THE SECOND FLOOR CORRIDOR,
FROM THE LOGGIA, RESIDENCE OF MRS. ANDREW
WELCH, SAN FRANCISCO, CAL. WILSON POLK &
CO., ARCHITECTS. LEO LENTE SCULPTOR.



EXTERIOR DETAIL. RESIDENCE OF MRS. ANDREW
WELCH, A. S. FRANCISCO, CAL. WILLIS POLK &
CO., ARCHT. LEO LENTELLI, SCULPTOR.



FOUNTAIN OPPOSITE THE MAIN ENTRANCE, RESIDENCE
OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS
POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.

method, subjected to no basic rules, and often left to chance.

In explaining his plan, Mr. Polk tells us that the reason for the interior court in San Francisco is very different from that which would determine its erection in Spain, Mexico or other warm countries. In these lands its object is to provide shelter from the extreme heat of the sun's rays; in San Francisco the court is intended for protection from the cold winds and sea mists prevailing at certain seasons, and is built to enable the residents to enjoy the available sunshine despite adverse climatic conditions. Certain arrangements of plan affecting exposure of rooms have also been dictated by circumstances of a purely local nature.

The exterior design of this residence has little to recommend it. It is representative of the type of stucco residence favored by the well-to-do merchants of Central and South America. The cornice and pilasters framing the windows of the second story are devoid of refinement. The entrance is disproportionately wide for its height. One is forced to conclude that the façade is a deliberate foil to the courtyard, intended to augment the reaction of surprise in a visitor's mind when entering the house.

Mr. Polk has been frank in his use of the *Caza de Zaporta*, and has not fallen into the frequent error of attempting to palm off an antique as currency. He realized that an exact reproduction is devoid of interest other than antiquarian, and that only in a remote degree. He has attempted to inject a touch of modernity in the surface treatment, but obviously without any intention of clipping a war horse to pass it as a polo pony.

We look to the Californian architects for the development and perpetuation of the sixteenth century Hispanic mode, which is theirs by inheritance, climatic conditions and natural setting. An array of essays accumulate in their State, representing varying degrees of professional attainment, ambition and opportunity; in

the majority, the indigenous "Mission" style prevails over the nobler phases of this art. We have yet to welcome the ideal combination of qualities in which the Californian will reveal his thorough appreciation of the esthetic ideals of the prototype when creating an edifice inspired by his pride of nationality.

When the intellectual activity of a race is thoroughly saturated with its national ideals, these are transmitted to its art impulse; they find concrete expression in those physical peculiarities of manner that we recognize under the generic term "style." By reason of the intangibility of the forces from which stylistic expression results, the national American style, when it finally evolves, will be unconsciously achieved; the vital and essential elements requisite cannot be assembled in deliberate creation.

Climatic conditions have always been a prime and controlling factor in architectural design, which argument should weigh in favor of a number of localized influences in treatment in the United States. A rational process of reasoning would single out the Pacific Slope as the birthplace of a definite phase of expression, stimulated by historic association and an innate attraction for the sixteenth century Hispanic. At the present moment this influence is at the stage of immature acquaintance, too unfamiliar to produce a habit of thought; but it apparently generates that type of enthusiasm and sympathy which is the most powerful motor of creative energy in all arts. The intellectual voice of every nation that has evolved a distinctive form of esthetic expression is attuned to that key best suited to its range, to which our modern capacity is rarely adjusted. It remains for the Californian architect to discover that congenial key into which the grandiose Hispanic Symphony may be transposed, that he may freely and naturally render this great theme, in works that will be golden contributions to the world's treasury of art.

SOME PRINCIPLES OF DESIGN AND CONSTRUCTION *in* DOMESTIC BUILDING



By Charles H. Moore

IT may, I think, be laid down as an axiom that wherever the domestic building of a people develops normally, with an eye to shelter and comfort, it will be agreeable in aspect, if not beautiful. However rude or humble, it will, when thus developed, have at least the quality of fitness, and will pleasantly mate with the landscape in which it is set. The peasant's cottages of European countries—the Swiss chalet, the French chaumière, and the English cottage—whether of the brick and tiled, or the half-timbered and thatched variety of the southern counties, or the stone and rough-slated cot of the north—are everywhere proverbially charming in aspect. Even the log cabin of the American backwoodsman has a natural picturesqueness, and an expression of adaptation to its surroundings, and to the life of the occupants, that make it pleasing to the eye. The old Dutch farm houses of New York, simply planned and solidly built of stone or brick, and the primitive New England farm house of weather-boarded timber—with its roof extended at the back in order to enlarge the ground floor—are invariably grateful in appearance.

Rising in the scale of architectural quality are the dwellings of the European upper middle classes, which in England acquire a particularly homelike expression, and from one phase of which we get our so-called Colonial style. These houses of average well-to-do people are attractive in proportion to their frank expression of straightforward provision for simple domestic needs and amenities; and it may be said that in every kind of house, on whatever scale, and of whatever degree of elaboration, architectural

merit will depend primarily on this expression embodied in substantial materials and sound construction.

Unhappily these principles have not governed recent domestic building in America, as they have that of the past. Instead of frank sobriety, and resultant dignity, in design, we now too often have all manner of sophistications in cheap materials, hasty construction, and meretricious ornament, so that our domestic architecture almost everywhere presents painful crudities and jarring discords, which the great inventive ingenuity of our time, that has revolutionized sanitation, and annihilated household drudgery by mechanical contrivances for convenience, cannot redeem.

It may seem a platitude to say that in designing houses there ought to be no sort of affectation, no preconceived notion of effect, internal or external; that everything should be based on the requirements of convenience and propriety. Yet it would be hard, I think, to find a large number of houses in America, built within the past few decades, that wholly conform to this principle. Most failures in design arise from want of that good taste which forbids the incorporation of borrowed fancies or features that are unnecessary or inappropriate in any given case; and it may, I think, be said without qualification that in so far as the designer starts with any aesthetic *parti pris* to which he bends any natural requirement of his project, he heads straight for disaster. This is not to say that he should never borrow. He may borrow freely from any source that offers appropriate suggestion, or adopt any form of which he can make rational use. By so doing he enlarges the range of his

possibilities and enriches his art; but this is very different from the promiscuous and capricious borrowing of foreign features now so increasingly prevalent in the designing of American houses.

Starting with the purely practical, let us consider what may be called normal procedure in the design and construction of a house. The first thing, of course, to be considered is the available ground area, and its orientation and conformation. Then the number and dimensions of the apartments required. Next their disposition with regard to convenient access—which involves the determination of halls and passageways and stairs, with spaces for the convenient location of the required baths and cupboards. The size of the ground area will determine the number of these apartments that can be situated on the ground floor, and we may proceed to develop the floor plans. Upper floor plans ought as far as possible to follow the plan of the ground floor, in order to get proper support for partitions.

The location of fireplaces for convenience and economy is a matter of great importance in planning that is not always enough considered. It is desirable, so far as possible, to avoid placing chimneys against outer walls, since when so placed they are exposed to the outdoor cold that will be likely to affect their drafts unfavorably. Whatever the general mode of heating, it is best to have if possible an open fireplace in every room. This secures the best means of ventilation, and the cheer of a fire when needed is worth a great deal of sacrifice to obtain.

Though planning may not always be found easy, its principles are simple, for domestic needs do not greatly differ among families of the same general status in life, and house planning for all conditions has been long enough practiced to have established an abundance of what may be called model plans, which, with minor readjustments of details to suit particular needs, will fulfil every requirement. Variations of plan may arise from the different conditions of ground area and conformation, just alluded to, as well as from different domestic requirements; and generally to follow what I have

called model plans does not mean that any two houses need be exactly alike. There may be an infinity of differences in the carrying out of a given general scheme.

It is a platitude to say that the best planning is that which gives the maximum of convenience and comfort, but convenience and comfort are not seldom sacrificed for the sake of some fancy that is incompatible with their attainment—as where in small houses a disproportionate amount of space is given to an entrance hall, so that the rooms have to be cramped, or reduced in number. This is too common in the more recent planning of small houses. A spacious hall comports only with a large house, and is not in keeping with the needs of a small one. But in the planning of halls and passageways, care ought to be taken to give them as much space as other requirements can be made to allow, and particular care is needed in contriving stairways. Considerable sacrifice in other parts of the house is preferable to restricted spaces for stairs. It is especially desirable to avoid winding stairs in narrow, and particularly in dark, places. Narrow winding stairs are a perpetual discomfort, as well as a source of danger. Then, too, all possible sacrifice elsewhere in the house is worth making in order to render stairs easy by low risers and broad treads; and it is of great importance that halls, passageways, and stairs should be well lighted.

It may be taken as a maxim that all fine aesthetic quality in building is based on strict rectitude of design and construction. This principle will, I believe, stand all tests, and its observance will be a sure safeguard against architectural aberrations.

After the floor plans are settled the elevation may be developed. The heights of ceilings must, indeed, be determined before these plans can be completed, for we have to know the number of steps required before we can find how far the stairs will extend on plan; and in order to determine the length of stair wells, head-room over the stairs must be considered. Then, of course, the thickness of each floor added to the heights of the

ceilings will give the total height of the house exclusive of the roof.

This brings up the question of proportions. No theory of proportions can be applied in designing a house. Proportions are largely, if not altogether, fixed by conditions. For while the heights of ceilings in all the rooms on each floor are normally the same, the floor areas of the rooms may differ greatly; and the proportions of the house as a whole are necessarily resultants of those of the units—rooms, passageways, and stories—which compose it. But within limits the designer may modify the proportions of the parts so as to secure agreeable proportions in the house as a whole. What it is that makes proportions agreeable can hardly be defined with precision, for aesthetics, in building as in everything else, lie in the domain of feeling, and transcend our faculties of reason. It may, however, I think, be said that the governing principle of proportions in any organism is that of effective function and congruity of parts. Apart from this principle there can be no true proportion in anything, and therefore all formulas of proportions are futile. Proportions will take care of themselves when the designer works without sophistication, as we see in all simple works, such as rural cottages and other unpretentious buildings in every country.

The form of the roof ought to grow naturally out of the exigencies of shelter and construction. It should, as far as possible, be such as to insure prompt and effective discharge of rain water, and in a climate where heavy snow storms occur, it will naturally have a high pitch. If there are rooms, either wholly or in part, in the roof, these may have to be lighted by dormers breaking the outline. If the plan of the house be a simple rectangle, the natural way to roof it will be in plain gable form. This form has the advantage of simplicity of construction, and also, where the pitch is high enough, of affording space for attic rooms that may be lighted by windows in the gable walls, so that the roof will not need to be broken by dormers. Or the roof may have the curb, or gambrel, form, giving headway over a larger area. This com-

plicates construction, but is justified by the additional cubic space it affords. Or again, we may have a hip roof, but this also complicates construction and diminishes space. Where the plan of the house is broken, the roofs of the several parts, if on the same level, will mutually intersect, and if their spans be unequal their ridges will be at different heights; but there need be no objection to this, it only gives a natural picturesqueness to the composition. The pitch of a roof may vary according to circumstances, but in general, as already remarked, it will naturally be high in a northern climate and low in a southern one. But conditions in any given case may call for a flat roof over some part of the house, as where a low projecting part, if roofed with a gable, or incline, would prevent proper lighting of the interior enclosed by wall against which high roofs would come. In such cases there need be no objection to flat roofs covered with copper, lead, or tin; but it is better in northern climates to avoid such roofs as far as possible.

The best architectural treatment of eaves and gables is that which is most natural. Construction alone may give an ornamental character. If the ends of the rafters be allowed to reach over the wall, their rhythmical series will have ornamental value. Ordinarily no cornice or solid parapet ought to rise above the eaves, because such a feature obstructs the free discharge of rainwater.*

In the treatment of gables, as of eaves, a natural method is best architecturally. No considerable overhang of roof is necessary at the gables, and the fixing on of vergeboards has no justification in structure. It is a superfluity which the straightforward designer will generally avoid.

Roofed verandas have the objection of darkening interiors, and whether the advantage of their shade in hot seasons balances the objection is a question that

*In large buildings, or churches, where a passageway is needed along the eaves, an open parapet—like that of Blois, or of Soissons or Chartres—may be necessary, and become a feature of great architectural value. In such cases the roof is set back considerably in retreat of the outer face of the wall, and a wide gutter receives the rainfall, discharging it at intervals through conduits.

each house builder must decide for himself.

In more elaborate building other features, as bays, pavilions, and turrets; or such details as base courses, string courses, and cornices, with which the house may be enriched, ought to be governed by the same principles of structural propriety. However amplified and ornamented, a good design admits no superfluity. Florid excess is a mark of bad taste in building, as in everything else.

We may now consider materials and methods of construction. In America, since Colonial times—more particularly throughout New England—the use of unsubstantial materials and methods has prevailed, with unhappy results on the general character of house architecture. Not only has wood been used almost exclusively, but it has been used with little regard to substantial building. Haste and cheapness have been sought at the expense of all that makes for duration and genuine architectural character. Houses framed of soft timber of small scantling, often in great part held together with nails only, and covered with thin clapboards, also of soft wood—their scant chimneys almost as unsubstantial as the woodwork—are deplorably common. Such building cannot have the humanized expression that ought to characterize the habitations of civilized man. This expression depends on good building, and adaptation to the amenities of human life. Buildings of wood may indeed be made substantial for a considerable time (as our Colonial houses and as Swiss chalets are); but the best materials are brick and stone. These are durable, are more safe against fire, they weather well, and always harmonize with the landscape. The charm of the older domestic buildings of European countries—particularly those of England—lies largely in their being built of materials that take the patina of time and the ivy mantling, by which nature adorns the work of man's hand and makes it one with itself. Only brick and stone receive this touch of nature kindly, and these only lend themselves to substantial building. As for concrete, now so much in vogue, it is of course only an artificial stone. It

has the merit of cheapness, but no other advantage; and its uniform surface is less pleasing to the eye than the varied surfaces of natural stone and brick. For color and texture no other materials can equal these. The most agreeable bricks are hand-made and wood-burnt. These often have a great variety of quiet color, ranging from dull reds—sometimes inclining to ochery hues, and sometimes to subdued crimson—to countless varieties of reddish and bluish greys and purples, all endlessly interfused and blended. Such bricks, laid with natural mortar joints brought flush with the face of the wall, and following the minor irregularities of thickness and outline in the bricks, make a wall the picturesque charm of which is only heightened by weathering.

The older brick houses that survive in New York and other American towns on the eastern seaboard are substantially built after English methods, and some of them are models of sound construction. But much of the more recent brick building of America is scamped and unsubstantial. No architecture worthy of the name is possible, however, in any kind of jerry-building. It may be worth while to describe a substantial method of brick construction still practiced in the better class of English country houses on a modest scale. A cellar extending under the whole house is rare, and there may be no cellar at all—the uses to which a cellar is usually put being provided for in extensions of the ground floor, and in contiguous outhouses. The footings for the walls are sunk deeply enough to make them secure against the action of frost, and dryness is prevented by damp courses in the brickwork, and by covering the ground within the walls with not less than six inches of concrete—the floor beams being raised about a foot above the concrete. A better way, however, is not to have the floor raised above the ground. In this case no beams are used, but the concrete itself makes the floor, the planks or other covering being laid directly on it. According to this method the concrete must be deeper, and must be effectively guarded against dampness. In this case, too, no particular wall footings are required, since the concrete is ex-

tended so that the walls may be built upon it. The method is as follows: An excavation of about sixteen inches in depth is made over the whole area to be covered by the house, and this extends about a foot beyond what is to be the outer face of each wall. This excavation is then filled with cement concrete to a depth of not less than twelve inches, and the concrete is covered with a damp course of melted tar, pitch, and sand. On this foundation the walls are built—all partitions, as well as outer walls, being of brick, save where, on upper floors, partitions may be required over voids. The bricks commonly used in England are roughly $4\frac{1}{2} \times 9 \times 2\frac{1}{2}$ inches in size, and for a house of not more than two stories, the outer walls will be three bricks thick, or roughly about fourteen inches. But for dryness the outer walls are often built hollow, that is to say, a solid wall of two bricks, or nine inches, in thickness, is supplemented by another wall of only one brick in thickness, standing at an interval of two and a half inches outside of it, so that the inner, or main, wall is shielded from the weather. These walls are carried up together, and are connected by iron ties about eighteen inches apart on every third course. This is not the best way to build a wall, but the protection from humidity and the warmth which it gives is a matter of great importance. In such construction the solid inner wall should be thick enough to give all the strength required—the function of the outer one being only that of a screen. This screen wall does, however, add considerable strength to the whole structure, besides giving dryness and measurable uniformity of temperature to the house. Hollow walls are now sometimes made of two four and a half inch walls, bonded as before with iron ties; but such walls are insecure if carried up for more than one story, and ought therefore never to be built above that height, if at all. The older houses of England have very thick walls, built solid. They are not seldom four bricks, or more, thick; and being plastered internally directly on the brickwork, they are cold and damp.

Where walls are built hollow for dry-

ness, in the manner just described, a question of architectural morality arises. The outer screen, being only one brick thick, would naturally be built in stretcher courses only. But the absence of headers suggests weakness—since the appearance to the eye is that of a wall wholly without bond, as where two four and a half inch walls are made to serve. To avoid this appearance, the outer wall may be built with half bricks where headers in a solid wall would come. But this may appear to savor of structural deceit, which can have no place in exemplary building.* But if the outer screen wall may be regarded as an expression of what really exists internally—the inner wall being truly bonded—perhaps it may be justified. To adopt this treatment where the structure consists of two thin walls in which no brick bond occurs at all would be indefensible. This may appear a small matter, but the principle of rectitude in design and construction is vital to architecture.

In good English building the walls of all chimneys, except the internal walls that separate the flues, are two bricks thick from the foundation to where they come out of the roof. Above the roof they may be diminished in thickness. Chimney breasts are of solid brickwork all the way up, having no hollow places in them, save those of the flues. This gives powerful anchorage to the house, as well as security against fire.

In addition to the damp courses laid over the whole concrete foundation, damp courses are laid on the first course of bricks in every wall, and on the last courses of chimneys below where they come through the roof.

Finally, the concrete foundation is covered everywhere within the walls, to a depth of about four inches, with coke breeze and cement, into which the floor planks are nailed, or on which tiles may be laid. A house so built is free from drafts from the floors, and impervious to vermin, as well as to dampness. And there is great security against fire, since the interior plastering is laid directly on

*Structure may be concealed—it is largely so of necessity in every organism—but that it must not be falsified is an immutable law.

the brickwork, and no lathing occurs, save on ceilings, and on the wooden partitions that may be needed on upper floors.

In normal English building, roofs are strongly framed with timber of good scantling, and double wall plates. The best are of oak, but spruce and fir are now becoming common. They are covered with boards and felt, on which battens running up and down are nailed, and on these are fastened horizontal battens to hold the tiles, or slates, that are almost universally used in England.

Casement windows are commonly, though not exclusively, used in country houses. The best have stone frames, with mullions and transoms, and metal sashes. They are set flush with the outer face of the wall, and the sills are weathered up to the sash. The jambs and lintels of the interior are usually plastered, and thus in this mode of construction no wood occurs about the windows, and no repairs are required. If the frames be of oak, they are left unpainted, as oak is durable in exposure without paint, and harmonizes well with brick or stone walls. If they be of deal, they are, of course, painted, but their sills should be of oak without paint.

It is unnecessary in this brief paper to speak in detail of interior wood fittings. There is much to be said in favor of oak, or other hardwood, without paint, for all interior woodwork. The initial cost of it is more than made up by the future saving of expense and inconvenience of repaintings that cheaper woods require. But interior fitting is of secondary importance. Where a comfortable house is wanted at limited cost, it is better to economize on interior finish than on construction. Have good foundations, solid walls, and safe chimneys, at whatever sacrifice of other things.

Of other methods of domestic building in England, one, which was very prevalent during the later Middle Ages, and still survives to some extent, is the so-called half-timber method, in which a frame of timber is filled with panels of brick or stone. The panels are brought flush with the outer face of the framework, which last is left exposed. This

kind of construction, as practiced in the olden time, is very picturesque. The timbers then were hewn, and were naturally more or less irregular, and often very crooked, though cut so as to lie evenly in the plane of the wall. In such construction the strength of the wall depends on the timber frame—the brick panels, being only for enclosure, have only the thickness of one brick. It is hardly a good way to build, though where heavy oak timber is available, it may be made very solid. Without oak, or other equally strong and durable timber, it would be quickly perishable and unsafe. In the past this mode of building prevailed extensively in the streets of many towns of Northern France, and particularly of Normandy. The picturesque charm of such towns as Lisieux and Rouen is mainly due to these buildings. Where the streets are more or less winding—as those of these old towns usually are—the perspectives are made endlessly beautiful by them. In many cases the timbers are enriched with carvings, and where upper stories project over lower ones—in order to get more room on upper floors than the restricted ground areas on narrow streets afford—timber braces are fixed under the overhanging parts, and these braces are sometimes enriched with figure carvings.*

But modern conditions make the half-timber method impracticable. Oak timber is now hard to procure, and is very costly. Moreover, as I have already said, it is not a really good way to build. The combination of wood and masonry in construction is never a good one. Either build solid walls of brick or stone, or build in wood altogether. Only aesthetic fancy is now the motive that leads to half-timber construction, and it is never carried out in the old-fashioned way. Where it is now practiced in England, the timbers are sawn, not hewn, and in order to

*All this wealth of old time picturesqueness is fast disappearing before the march of modern life, and for the most part without any necessity. But the importance to ourselves, and to coming generations, of the world's artistic patrimony is very great, and is not enough realized. The value of the great monuments of the past, that have been wantonly destroyed by the Germans during the past four years, is beyond all computation. The pleasure and profit to Americans of visiting Europe has been deplorably curtailed since 1914.

simulate old work, they are sometimes gone over with an adze.

Whatever materials or methods be employed in building, the results will be good only in so far as the designer is imbued with the principle of structural and aesthetic honesty. Let him indulge in no capricious fancies or oddities. Let him not copy foreign styles or features that are not germane to the conditions of cli-

mate, or the modes of life, for which he should provide; and let him not seek to be original. There is little possibility of individual originality in domestic building. Every genuine architectural evolution—like every development in other departments of human activity—is worked out for the most part unconsciously, and collectively, not individually.



A POST-WAR CONSTRUCTION PROGRAM

THE BUILDING BUREAU *of the*
INTERNATIONAL COMMITTEE *of the* Y.M.C.A.

PART I

By Charles C. May

ONE who stops to think over the various classes of architectural work which find their way into the pages of the professional magazines will doubtless be surprised to find how small a proportion of these pages have dealt with the planning and design of Y. M. C. A. buildings. In general the plate files of the architectural office become cluttered with a mass of material accumulating faster than normal absorption can take care of it. With Y. M. C. A. buildings the opposite is true. Oftentimes the architect's file is empty; otherwise the material is fragmentary or obsolete; in fact, no case of an article within the past five years treating the subject in a manner at all comprehensive comes readily to mind.

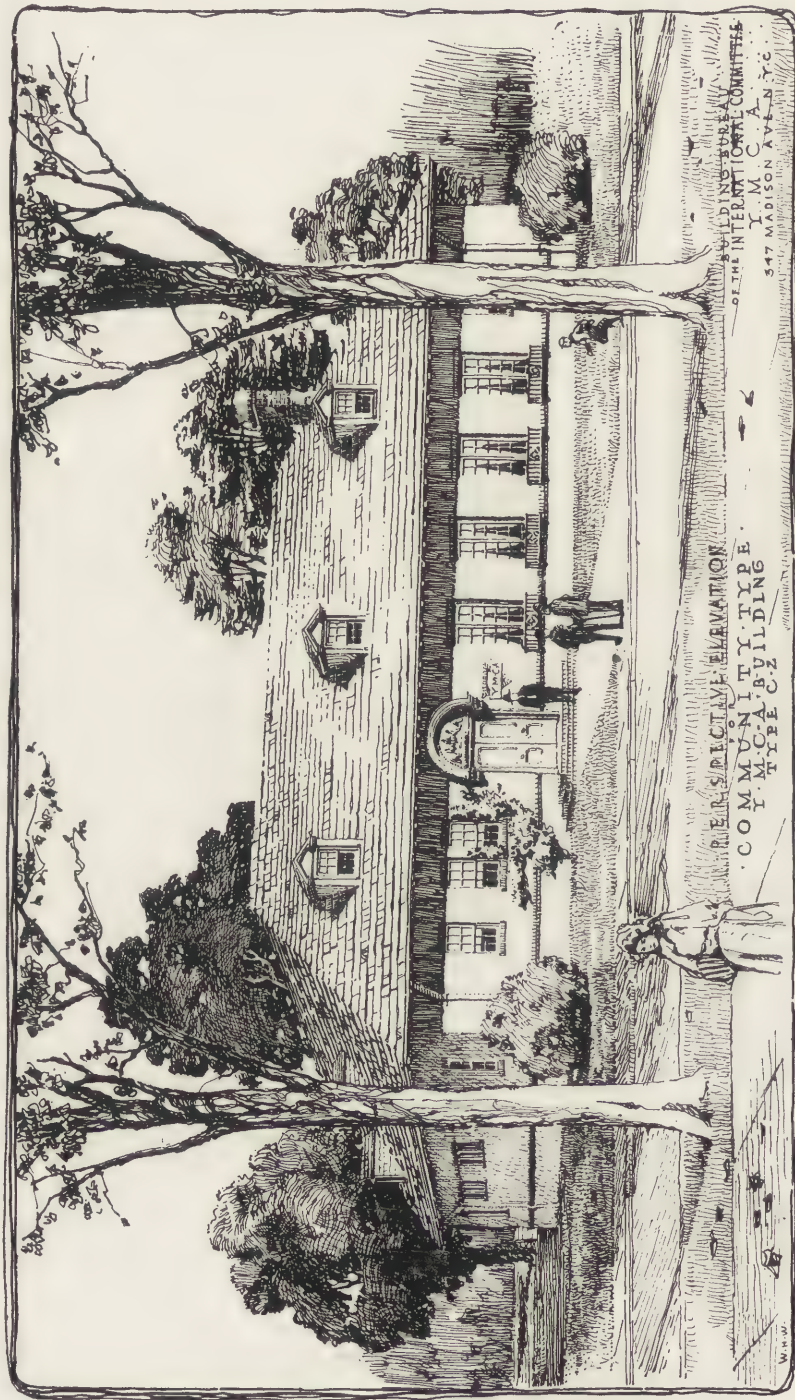
This lack of published material is the more striking when contrasted with the bulk of executed work. During the past fifteen years, Y. M. C. A. buildings throughout the country have multiplied prodigiously. Not less than 500 new buildings have been erected, aside from the numerous cases where alterations have transformed buildings for Y. M. C. A. use. Count the cost of such new construction work at the seventy-five millions of dollars to which it has mounted, and the matter becomes of interest to the least worldly-minded among the profession.

It may be that this apparent apathy has been due to an assumption on the part of the practitioner that Y. M. C. A. work, unless he were a "Y. M. C. A. architect," was a closed door to which he held no key. The term "Y. M. C. A. architect" is accurate, not as a personal Homeric epithet, but as denoting a highly specializing and numerically small group within the profession. For the fact is that more

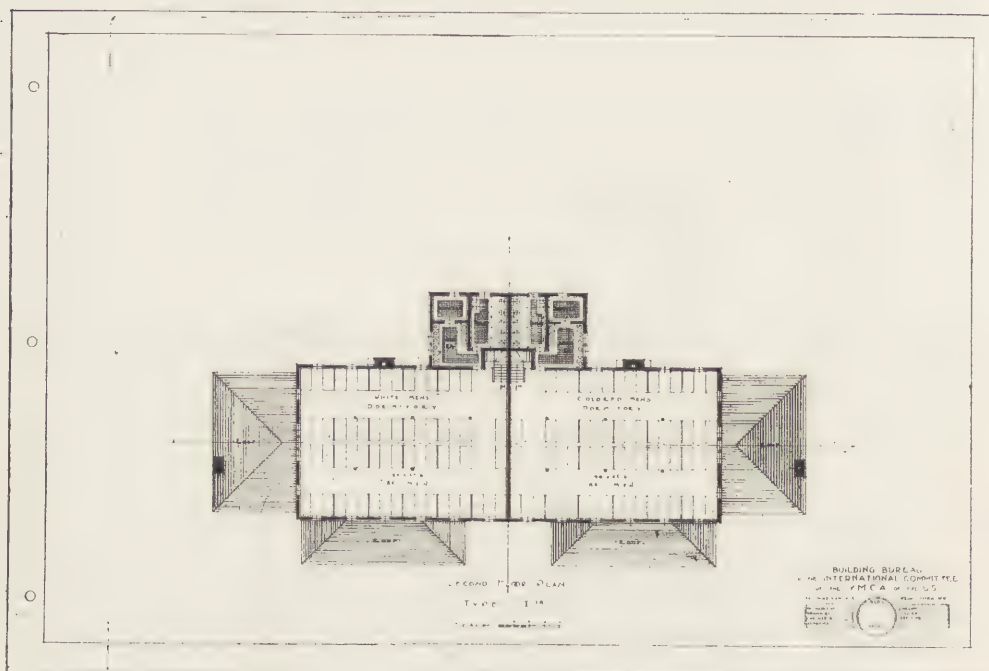
than two-thirds of this mass of work during the last fifteen years has been handled by a half-dozen or so firms which have confined themselves almost exclusively to this branch of work. To them is due a large measure of credit for the development, enlargement and elaboration of function in the physical plants, as they have constantly been put to it to keep pace with the increasing size and complexity of Y. M. C. A. activities. For it must be realized that this is one of the most highly specialized and in certain respects most intricate planning problems in the whole field of design.

There is, however, the obverse side of this, as of all similar pictures. With intense specialization there is prone to appear a tendency toward fitting one's favorite formula to a set of given conditions instead of allowing the conditions themselves, through study with open mind and fresh eye, to dictate the solution. Furthermore, when the job was to be handled by an outsider—a non-specialist—it was extremely difficult for him to gain the intimate knowledge of Y. M. C. A. working principles, departmental functions, controls and interrelations, which together constitute the stock in trade of the inner circle of specialists. It became evident in the course of time that there was need for a central bureau within the organization, which could direct its own building activities and act as a clearing house for such information—a mass of data constantly accumulating, always in flux, and reflecting progress and modification of the Y. M. C. A. idea.

The Building Bureau of the International Committee of the Y. M. C. A. is not a new institution, for it has been in existence some three years. Of this period twelve months were spent upon an



A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS
OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A
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FOR A SHIPBUILDING YARD, EMPLOYING WHITE AND COLORED HELP.

intensive study of the planning problem from the organization standpoint; during this time Mr. Neil McMillan, Jr., Director of the bureau, traveled very extensively, visiting almost every important Y. M. C. A. building in the country. Then came this country's entry upon the war, and for the following eighteen months the bureau had charge of all that tremendous amount of construction work for the Y. M. C. A. which was done among the war camps; the other six months have been equally busy in preparation for and launching out upon its new program. The bureau had formerly been able to serve local building committees to a certain degree. It had, for example, been accustomed to furnish plans for previous buildings which were hopefully intended to aid in solution of the problem in question. Unfortunately, a plant of so many interdependent branches as a Y. M. C. A. building (and no one who has not planned such an outfit can appreciate this intricacy)—can not clearly express these functional relations on a set of blueprints, nor can the most intelligent student divine them by examination from the outsider's viewpoint. The result

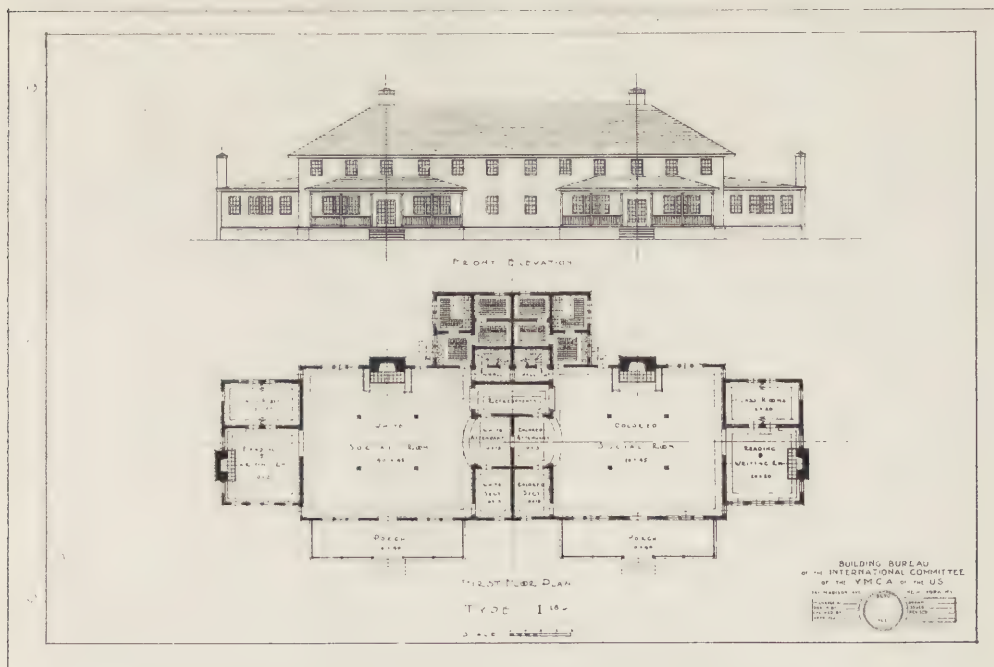
of this system of blueprint distribution, therefore, left much to be desired. As often as not, the main idea was overlooked, and minor specialties, visible to a superficial eye, were pounced upon for use in a plant where they applied not at all. Taken in the large, the wonder is that the architectural output of Y. M. C. A. building has been as good as it is. The Building Bureau of the International Committee hope to make it better still. They foresee, with no telescopic vision, a tremendous increase in the demands upon their organization in the approaching peace era; they propose to make their future plants increasingly the expression of a focusing of the most able and widely distributed architectural talent of the country upon their problems.

This forecast of future large demands upon the Y. M. C. A. building organization is based upon several well-grounded premises. There is, to be sure, the normal growth of the organization, which cannot conceivably fall short of the record of the pre-war period; there is, again, the extra amount of work which must to some degree compensate for the very serious underbuilding of the past

three years; then there is the influence upon future construction, of a new conception of the Y. M. C. A. in relation to its work in large cities and in moderate-sized ones having satellite communities more or less closely allied with them. Under such conditions it is proposed, instead of maintaining a single large central plant, to recognize the *neighborhood* tendency as it is being more and more expressed in community life. There will still be a Central Branch Y. M. C. A. building, but somewhat smaller in size, and there will be, in addition, a number of buildings of the new "community" type, located at strategic points, preferably adjacent to athletic fields. The illustrations show sketches for one of the earliest of this type of building, as well as a map showing in diagrammatic form the locations and spheres of influence of a cluster of such units. This map indicates, finally, a branch of work which promises to require a considerable amount of new building construction—that is, the industrial type. Here the Y. M. C. A. proposes to establish buildings as centers for the community life of

the workers in a single large plant, or those of a group of smaller plants in an industrial town. Taken in the aggregate, these anticipations of building activity are impressive, even to our present enlarged habit of mind.

Before we speak of the specific program there are a couple of considerations which apply to the Y. M. C. A. building as a class, and which thereby become a part of the background for every such planning problem. To begin with, the building appropriation is almost without exception a sum fixed with a Medes-and-Persian fixity. Other classes of building set a limit upon the appropriation, but there is always a financial factor of safety—a slight degree of flexibility wherewith to meet the exigencies of building operations—some of which admittedly cannot be foreseen. In Y. M. C. A. work the requirement is to do the work for the appropriated sum—or go without. And, remembering that bids on identical plans and specification are wont to vary by 10, 20 or even 30 per cent., it becomes no mean task for the architect to incorporate in his building the maximum



FOR A SHIPBUILDING YARD, EMPLOYING WHITE AND COLORED HELP.



SUGGESTED ELEVATION
 COMMUNITY TYPE T.M.C.A. BUILDING
 SCHEME - C-1

BUILDING BUREAU
 OF THE INTERNATIONAL COMMITTEE
 OF T.M.C.A.
 347 MADISON AVE., NEW YORK, N.Y.

100-10

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS
 OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A

accommodations so that the lowest bidder of the group will just equal the immovable number of dollars.

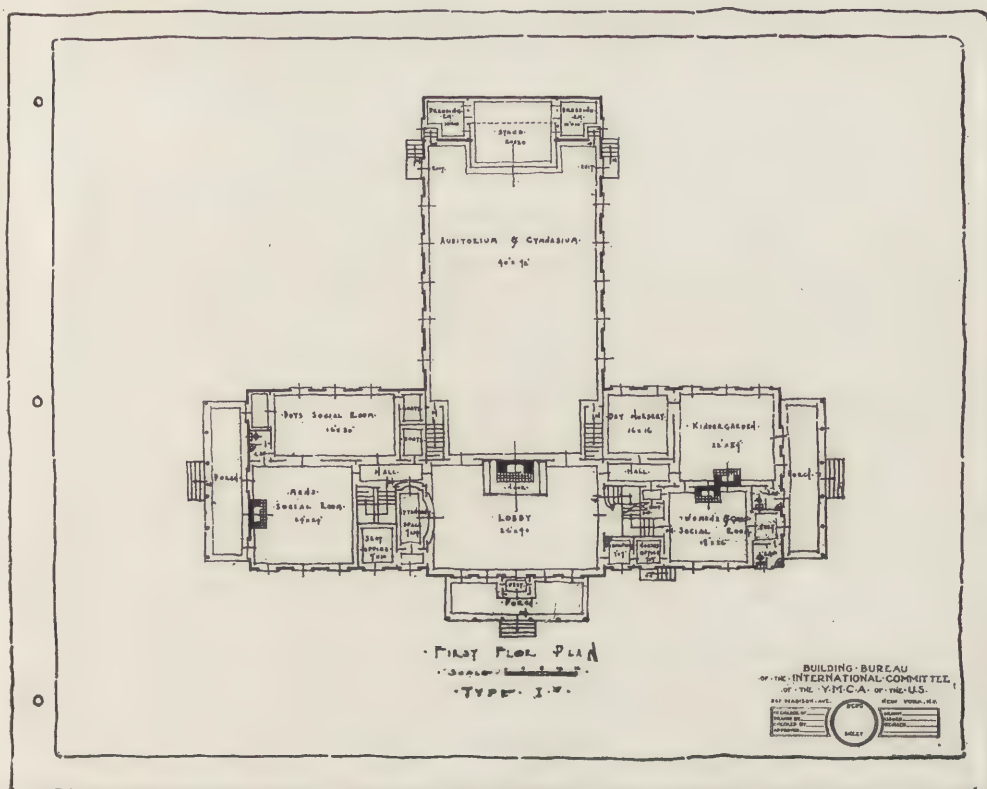
Then, too, the architect is here dealing with a building committee which, it must be admitted, is not invariably a unit within itself, nor always equipped with the seeing eye to distinguish the better from the worse; even secretaries sometimes have pet ideas whose absence from the new building will leave it in their eyes a hollow mockery, and their own spirits, areas of devastation. This responsibility to a committee of diverse personnel is common to other types of architecture—banks, churches, and the like—but it is one item in the composite background in the Y. M. C. A. work. Add to these one further consideration. The Y. M. C. A. building makes its appeal to the public through its architectural design, the quality of its finish, and the more obvious aspects of planning; that is, directness of access, quality and sufficiency of equipment, comfort and pleasureable aspects of the club features. These are to the organization, also, essentials; but a building may possess them all par excellence and yet prove a white elephant eating up all the fodder to be had and still looking for more. In other words, not only must the first cost of a building be rigidly limited to a given sum, but the cost of running the plant must be within the limits of income which can be relied upon. Failure in this respect gives an ill-kempt, down-at-the-heel look to the building, insufficient control and supervision of club activities, and, probably, an incomplete utilization of the plant's capacities. The testing of this feature of maintenance cost by forecast from a set of plans has been one of the troublesome features in past procedure—it is by the same token a point at which the Central Bureau can most directly prove its worth and earn its cost for the national organization.

With these points in mind, we can better move on to look over the program of the Building Bureau for its wider and widening activities. And at the outset it should be made clear that what it is anxious *not* to do is to usurp the architect's prerogatives or to destroy his initiative. It desires rather to provide a co-operating source of accumulated and authoritative

knowledge, upon which the architect can draw to his own immediate benefit and, ultimately, to that of the organization and its membership. Bear in mind also that the Building Bureau is *not* a group of Y. M. C. A. secretaries who have been designated a committee to take charge of construction work; it is, on the contrary, composed of technical men, adequately equipped with architectural and engineering training, who have been absorbed into the Y. M. C. A. organization from the professional field.

There are two kinds of services which the bureau proposes to furnish for any prospective building: Full Designing Service and Advisory Service. They are distinguished in that the bureau, in the former, prepares the preliminary studies in its own drafting room while in the advisory service the architect submits his own sketches for approval by the bureau. Considering this limited form of service first: the bureau comes upon the scene as soon as a branch organization makes known its intention to build. The entry of the Central Bureau at this stage is vital, for, under the old régime, one of the greatest difficulties arose from calling in the advisory body too late—when the building committee found itself in trouble; when plans had gone too far to be changed except at a prohibitive loss in time and cost. The bureau is expected, then, under the new program, to be notified of the intention to build when the project is in its infancy, and particularly before the architect has been selected. No part of its work is more vital than this at the outset. The bureau sends out representatives to look over the ground, learn the requirements, acquaint themselves with the professional talent in the neighborhood—for the policy is strongly for using local architects wherever feasible—examine sites and confer with the local committee on all questions of early policy. Having acquainted themselves with the general features of the problem, having examined executed work of the architects under consideration, the bureau's representatives are in a position to narrow the choice down to three or four names; with these they go into the matter further in detail, until they are ready to go back to the local building





DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF
MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.

committee with a definite recommendation.

If this recommendation goes through, as it is all but certain to do, the formal appointment of the architect takes place, and the contract, which is always made for professional services, is drawn up and duly executed. This contract (we are speaking of the case of advisory service on the part of the bureau) differs little from the usual document of its sort, except for one or two clauses. These are, however, noteworthy. For the first, the architect virtually guarantees to design a structure which can be built for the appropriation—a sum stipulated in the contract as the cost of the building. That is to say, in case the bids received on his estimating drawings exceed the appropriation, he agrees to make such revisions as may be necessary to bring the price down to the desired limit, without cost to the owner. This does mean, to be

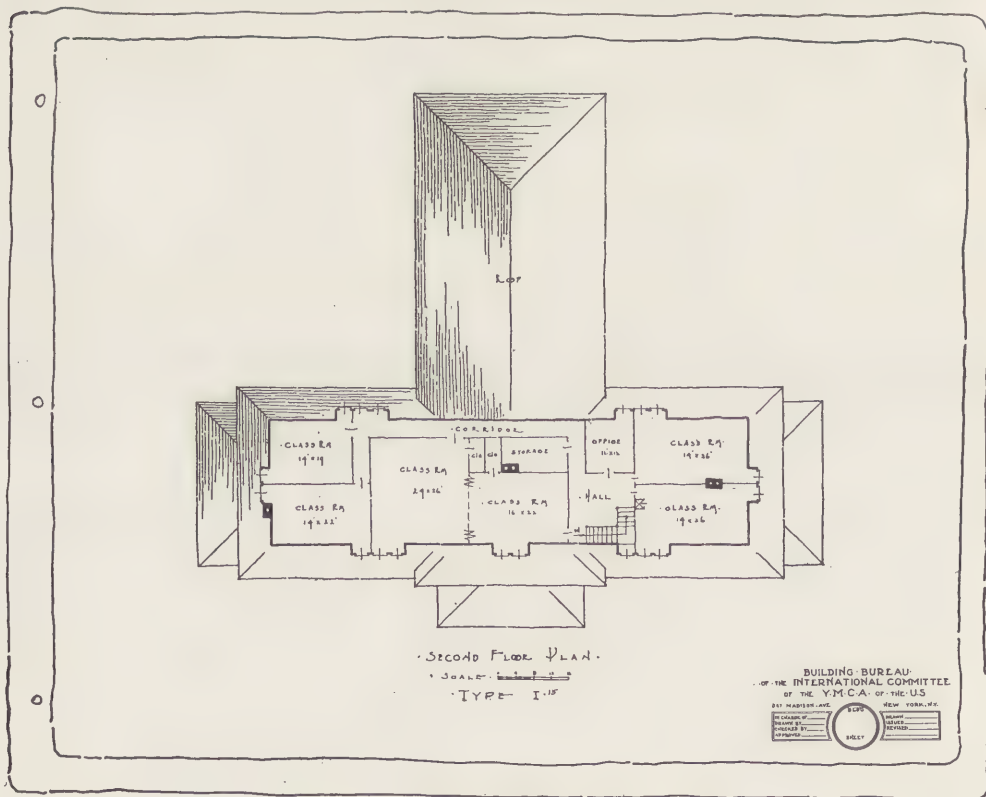
sure, at greater or less cost to himself, for the other noticeable feature of the contract is that the architect's commission is not based on a percentage of the cost of construction, nor calculated from the drafting and overhead costs, but is a fixed sum, agreed upon in advance and laid down in the contract. The percentage fee is discarded because of the usual criticism that under it the interest of the architect runs counter to that of the owner. It ought, presumably, to run parallel, or at the least be independent. Here it is hoped that, by making definite from the first the exact amount receivable, the architect's mind may be set free to devote itself to the single purpose of producing the desired set of accommodations at the given price, by the most direct route and in the most efficient manner possible.

Under conditions prevailing at present it is fair to say that this stipulation re-

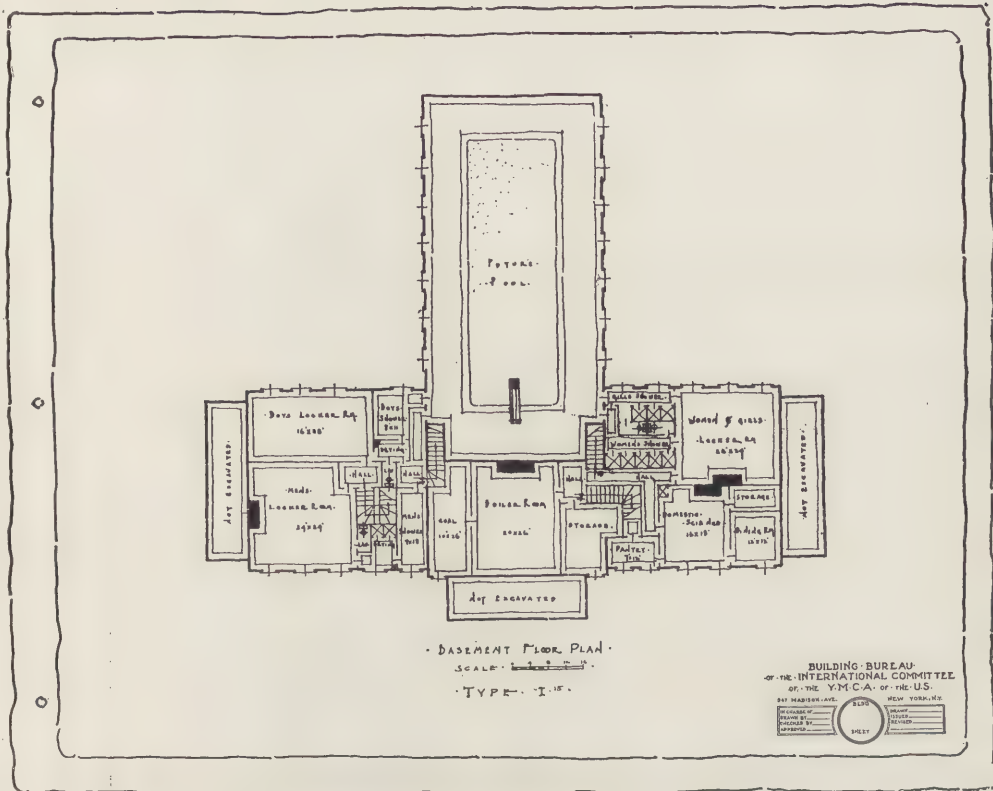
garding free revision of drawings might easily work hardship to the architect, for no one can forecast costs with any accuracy so long as labor and material prices maintain their hectic instability. On the other hand, it should be remembered that this contract is drawn up with a view to the whole era of peace-time construction which is in vivid anticipation throughout the Y. M. C. A. circles. Under stabilized conditions, and with the accumulated knowledge in the bureau's experience, it should become possible before long to make a very accurate preliminary estimate of the building cost before drawings have left the architect's office for bids.

The question may properly be asked, who pays for the work of the bureau? Is the cost of its service to be deducted from the commission the architect would ordinarily receive, and does the fee fixed in the contract represent such a net sum?

That, happily, is *not* the case. The sum paid the architect is a matter of adjustment for each case, determined by the individual conditions, but based upon and in some cases as great as the usual professional fee for the service required. The bureau receives compensation from the local organization, for its services as expert adviser, exactly as the consulting engineer or operating adviser is called in by the owner or architect in other problems of a technical nature. For the limited service, that is, for the case where preliminary studies are prepared by the architect, and the bureau's capacity is purely advisory, the charge is a fixed fee of 1 per cent. on the proposed cost of the building; for the complete service, where the bureau itself makes the preliminary studies, the charge is 1½ per cent. In this case, of course, it is proper that the smaller amount of work done by the archi-



DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.



DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.

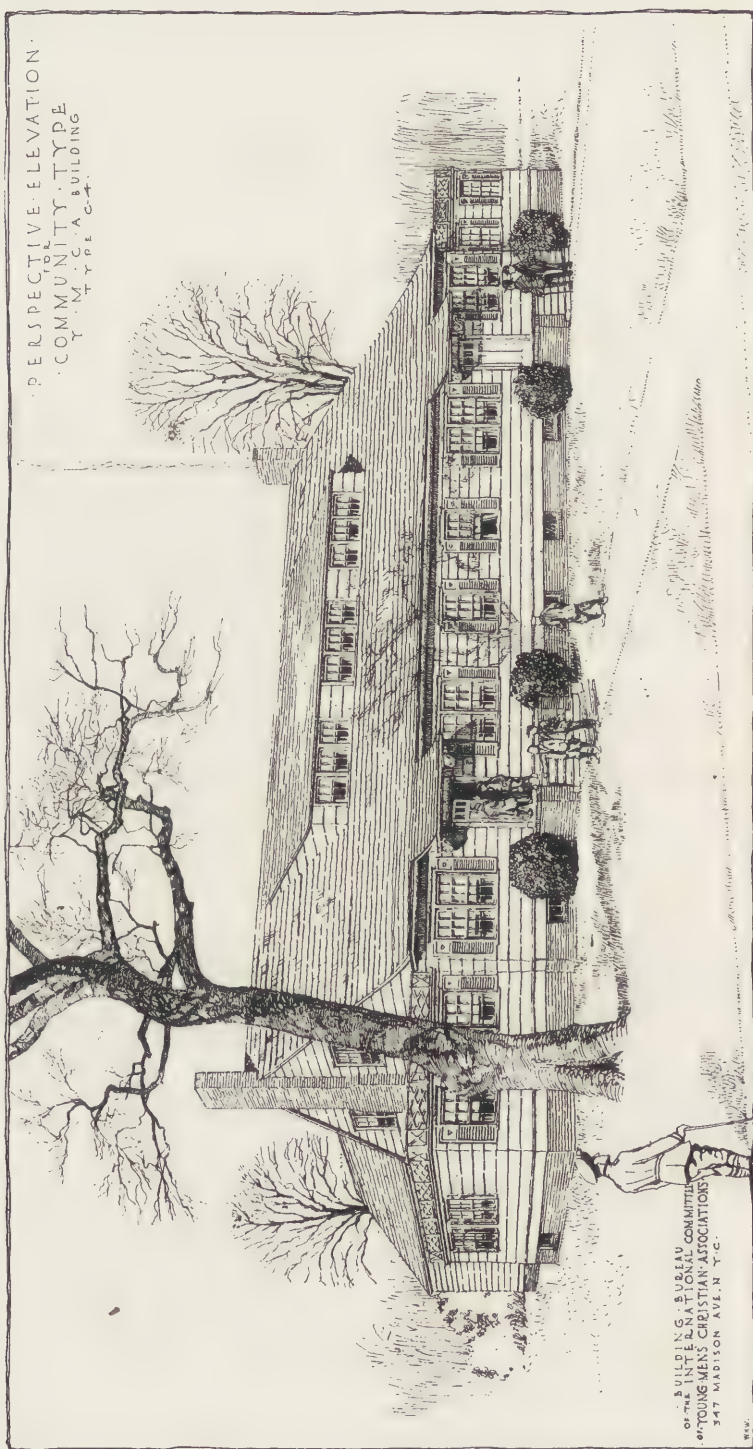
tect should be reflected in the amount of his fee.

It should also be noted that the contract provides increased compensation for the architect in case the requirements for the building itself should be altered in any vital respect. This is not unheard of, for a sudden wave of enthusiasm may produce a larger building fund than was originally counted upon.

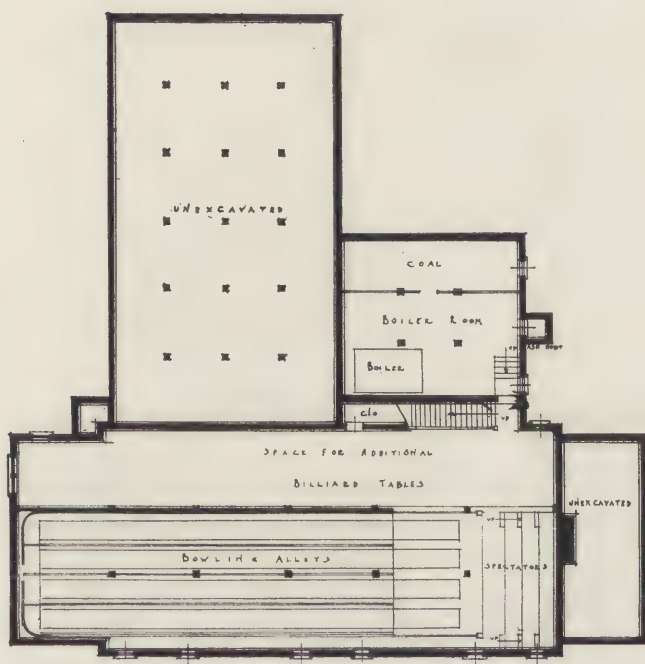
We digressed from the chronological order of events in order to take note of the nature of the architect's contract. The next step after its signature is likely to be a tour of inspection of existing plants, by architect, local building committee, and a representative of the bureau. This tour may run through a week or ten days, and during this time the process of saturation of the architect's mind with the Y. M. C. A. idea, and with the elements of the planning problem, has been continuing, together with the accu-

mulation of ideas and principles for application to his own planning problem. There is a difference (let us note in passing) between this kind of accumulation of *principles*, and the accumulation of *things* with which the building committees used to return home, with the result that there was a call for the embodiment in the building, of the gymnasium from Brooklyn, the swimming pool from Rochester, the locker room from Minneapolis, and so on, *ad infinitum*. That system of accumulation tended to produce confusion rather than simplification.

In all probability the preliminary studies have been started *en tour*; at any rate their preparation, discussion, revision and adoption become the immediately ensuing task for the architect committee and bureau. From this point through to the construction and occupancy of the building the procedure is precisely that of the usual architectural



A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS
OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A
BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO
SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



BASEMENT FLOOR PLAN
SCALE $\frac{1}{16}'' = 1'-0''$

• TYPE C4 •

BUILDING BUREAU
OF THE INTERNATIONAL COMMITTEE
OF THE Y.M.C.A. OF THE U.S.

347 MADISON AVE. NEW YORK, N.Y.

DESIGNED BY	DATE	REVISION
DRAWN BY		
CHECKED BY		
APPROVED		



A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



FIRST FLOOR PLAN
SCALE $\frac{1}{8}" = 1'-0"$

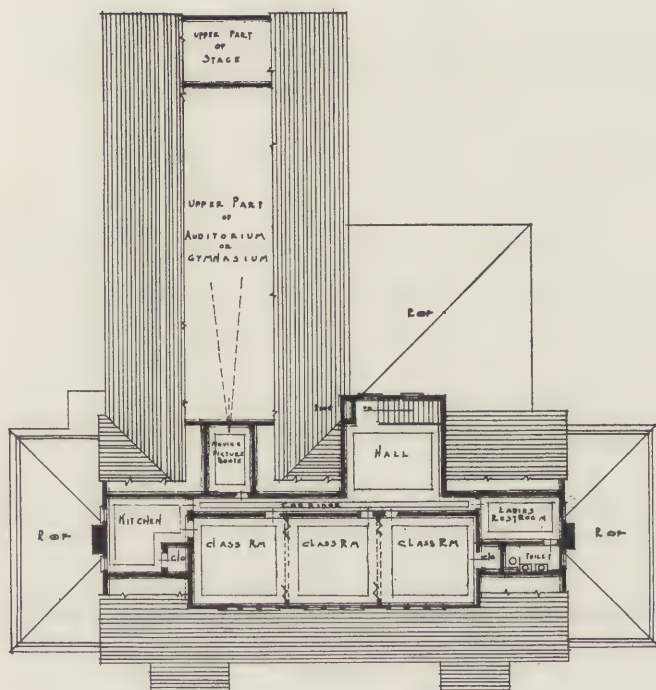
• TYPE • C 4 •

TOTAL AREA 6,700 SQ. FT.
TOTAL CUBAGE 107,700 CU. FT.

BUILDING BUREAU
OF THE INTERNATIONAL COMMITTEE
OF THE Y.M.C.A. OF THE U.S.

537 MADISON AVE. NEW YORK, N.Y.
DESIGNED BY: []
CHECKED BY: []
APPROVED BY: []
REVISIONS: []
REVISED: []

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



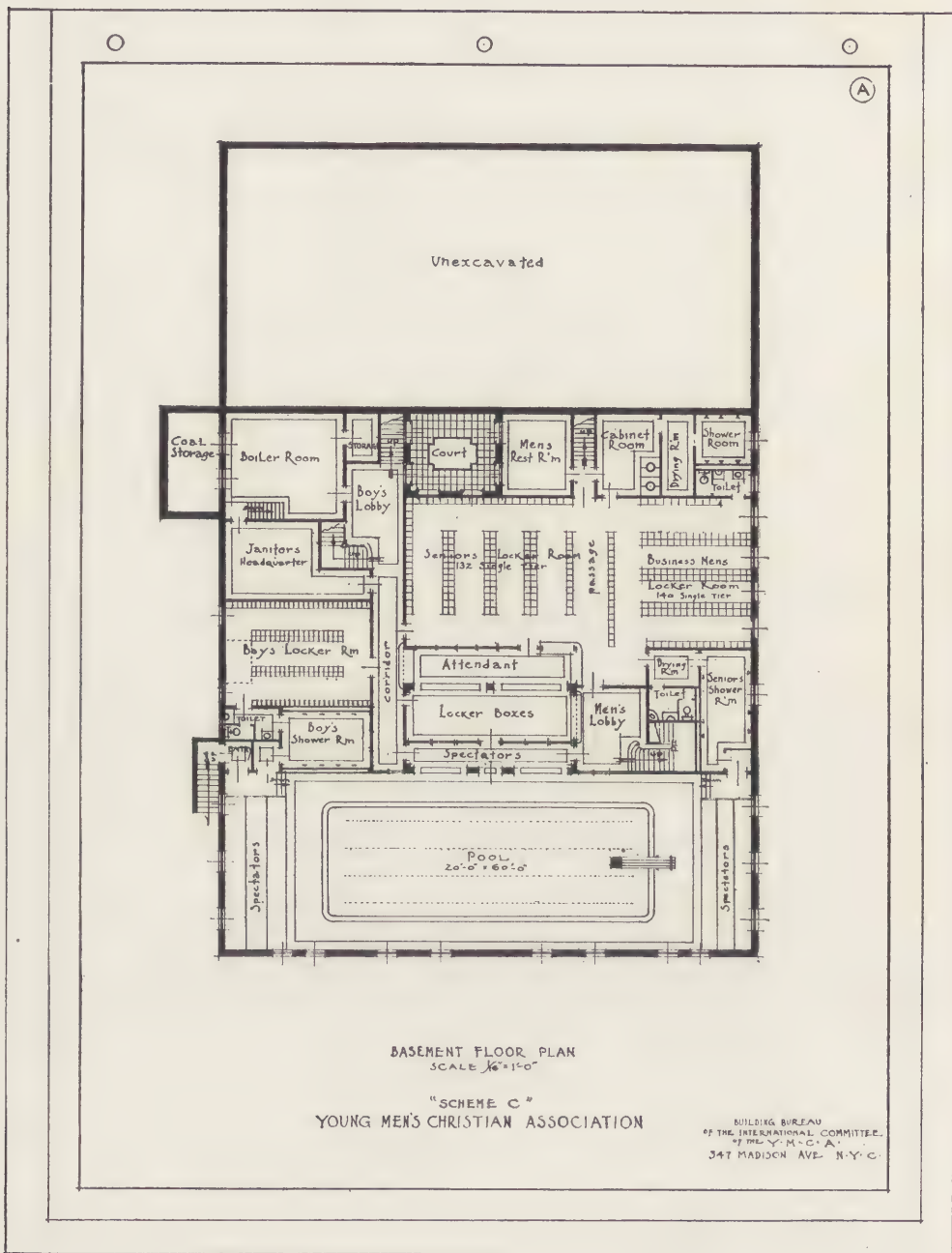
SECOND FLOOR PLAN
SCALE $\frac{1}{16}'' = 1'-0''$

TYPE C4

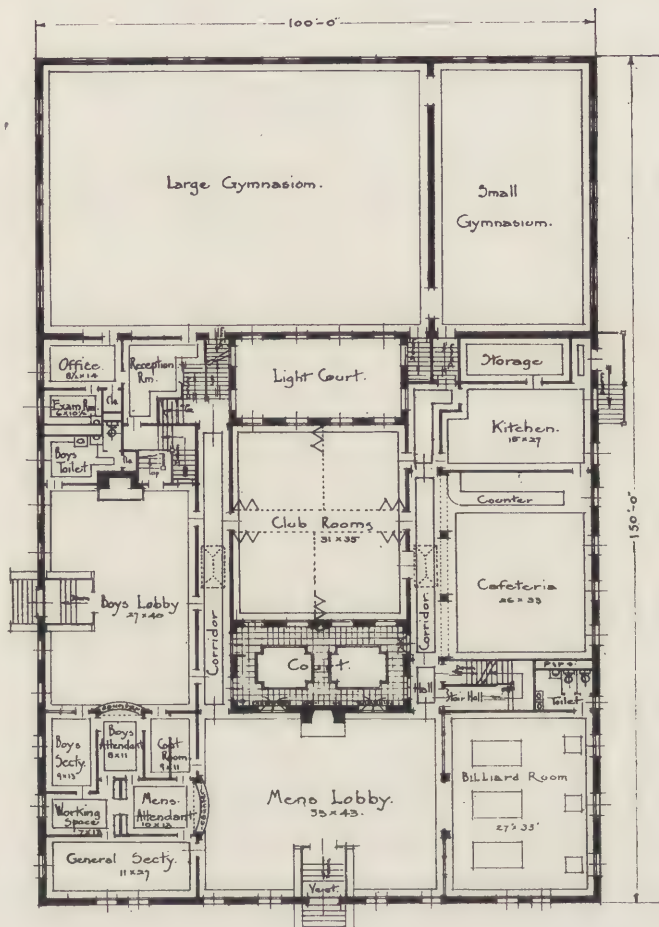
BUILDING BUREAU
OF THE INTERNATIONAL COMMITTEE
OF THE Y.M.C.A. OF THE U.S.
847 MADISON AVE. NEW YORK, N.Y.
DESIGNED BY _____
CHECKED BY _____
APPROVED BY _____



A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS
OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A
BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO
SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



A BUILDING FOR WHICH DRAWINGS ARE NOW UNDER WAY TO SERVE A SMALL CITY. AN UNUSUALLY COMPLETE LAYOUT FOR A BUILDING OF THIS SIZE.



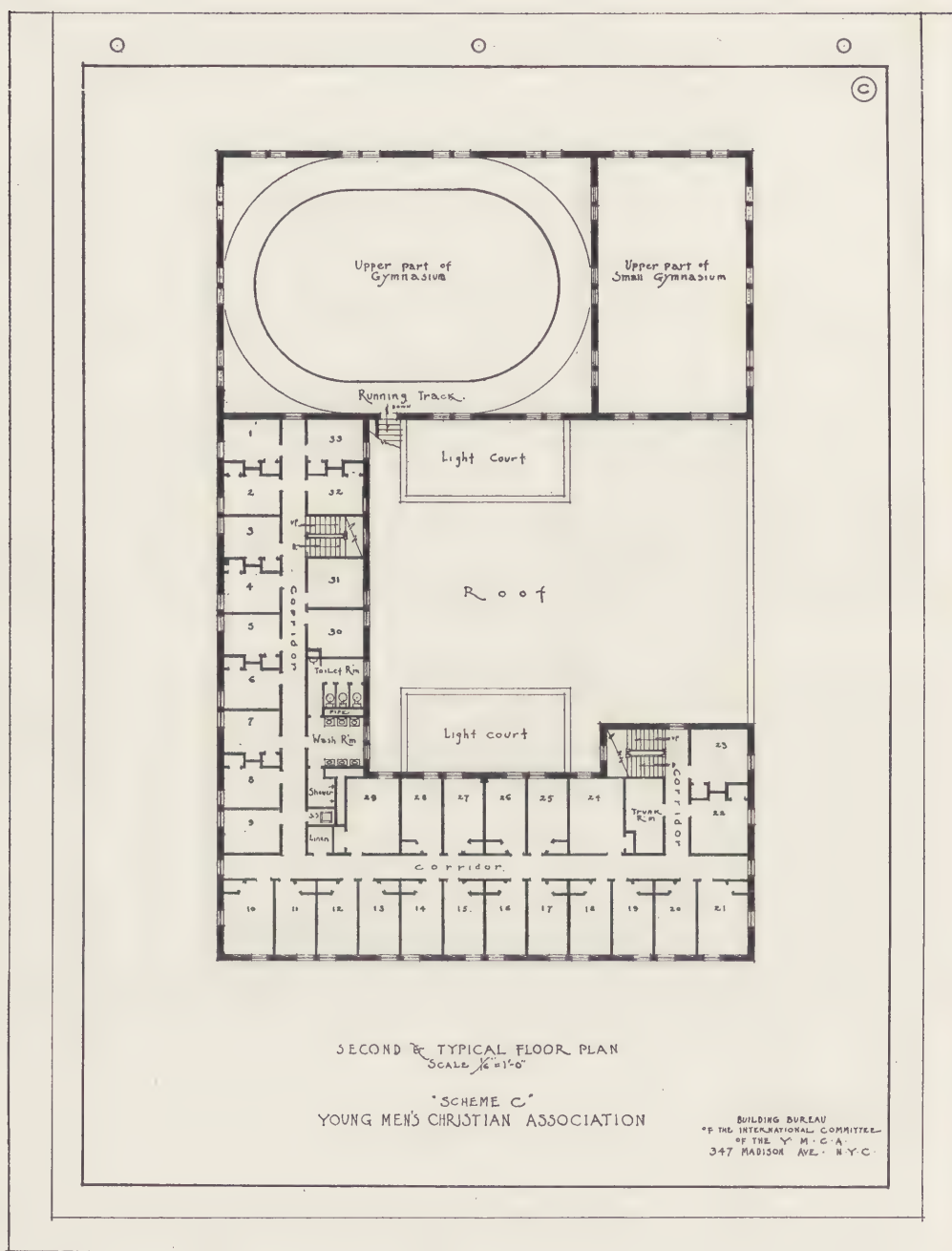
FIRST FLOOR PLAN
SCALE $\frac{1}{16}'' = 1'-0''$

"SCHEME C"
YOUNG MEN'S CHRISTIAN ASSOCIATION

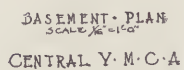
DESIGNED
CONSTRUCTION
COST OF BUILDING
CYBAGE 470,168 1/2 FT
COST PER CUFT.
AREA 117 FLOOR - 15000 SQFT.
HEIGHT.

BUILDING BUREAU
OF THE INTERNATIONAL COMMITTEE
OF THE Y. M. C. A.
347 MADISON AVE. N.Y.

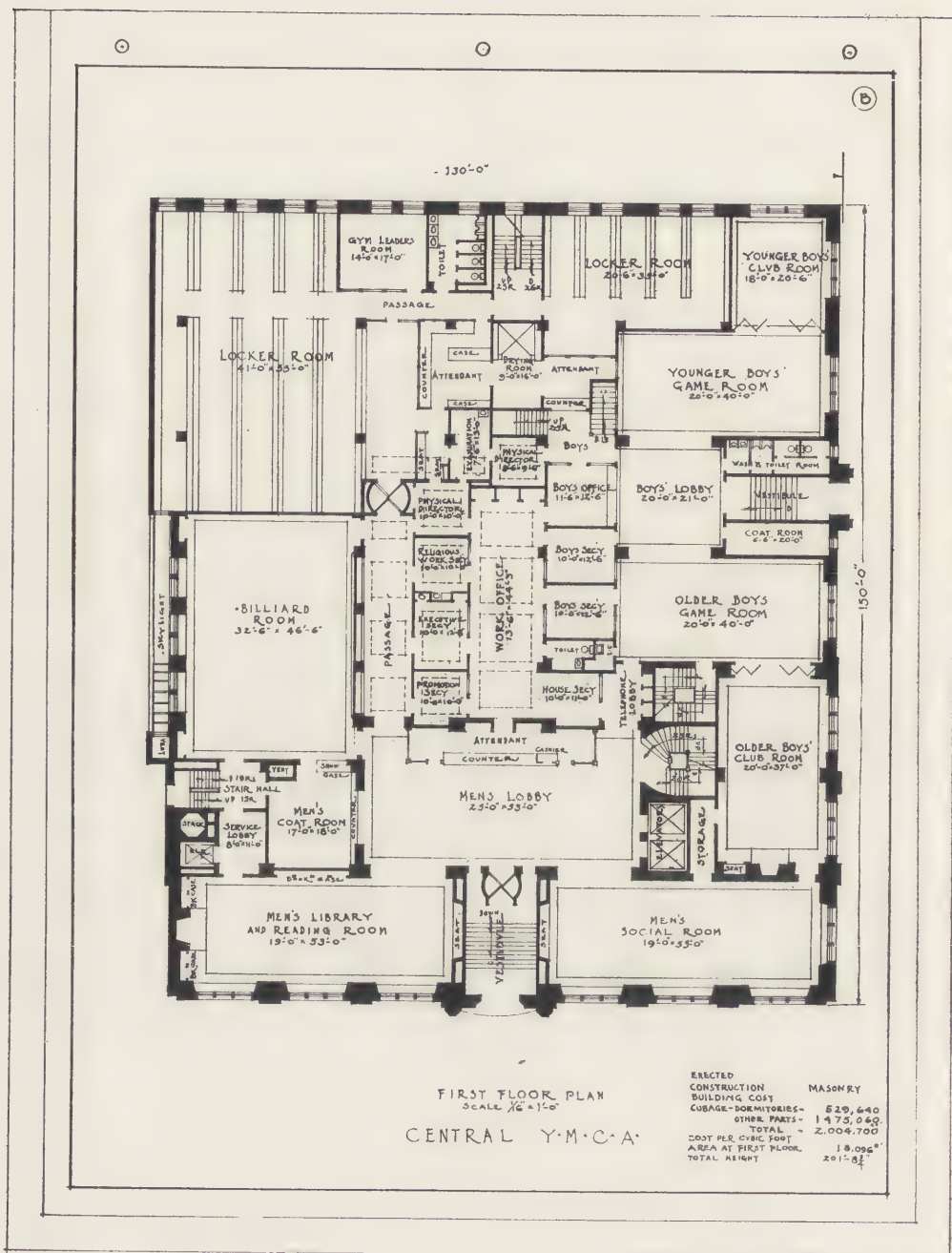
A BUILDING FOR WHICH DRAWINGS ARE NOW UNDER WAY TO SERVE A SMALL CITY. AN UNUSUALLY COMPLETE LAYOUT FOR A BUILDING OF THIS SIZE.



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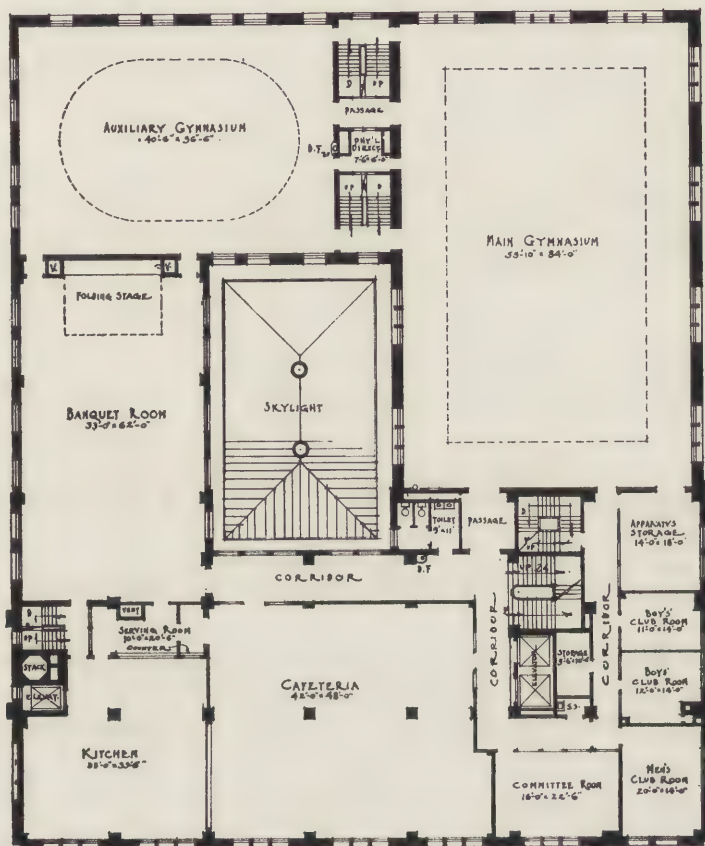


ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.



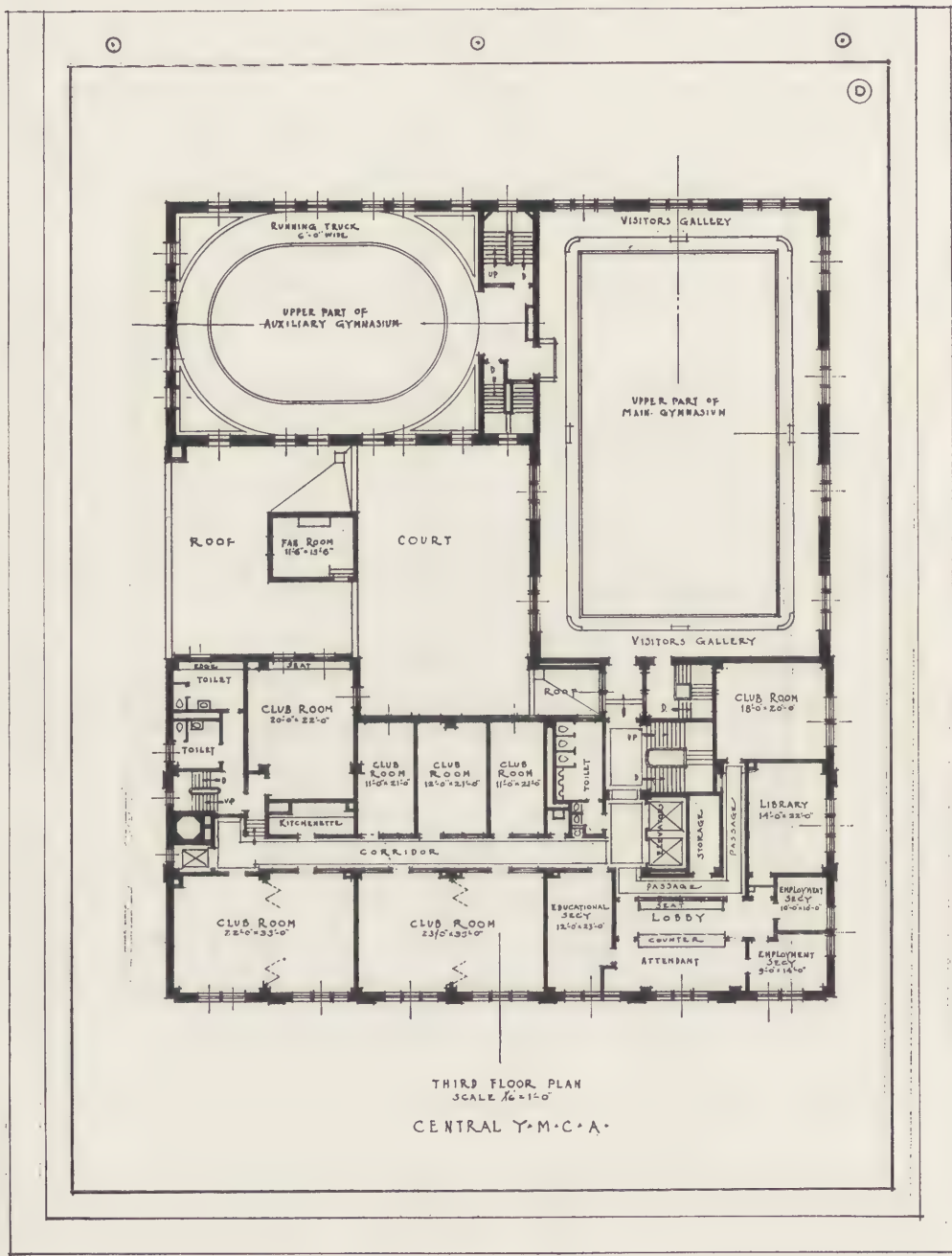
LONG LAMDEBAUX & LONG ASSOC. ARCHTS
SHATTUCK & HUSSEY

ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.



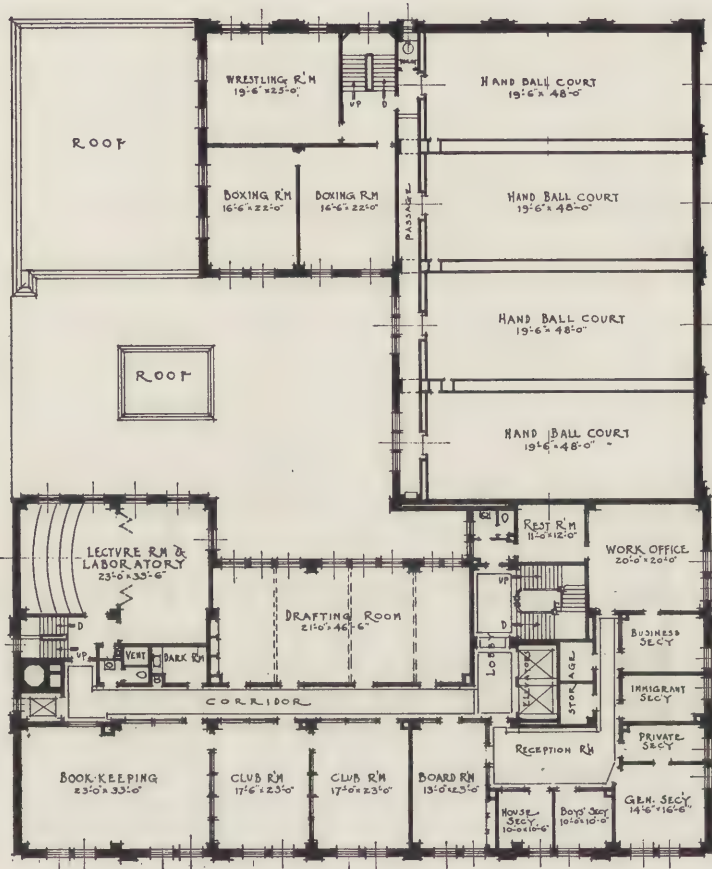
SECOND FLOOR PLAN
SCALE $\frac{1}{16} = 1'-0"$
CENTRAL Y.M.C.A.

ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.



LONG LAMOREAUX & LONG
AND SHATTUCK & HUBBARD ASSOC. ARCHTS

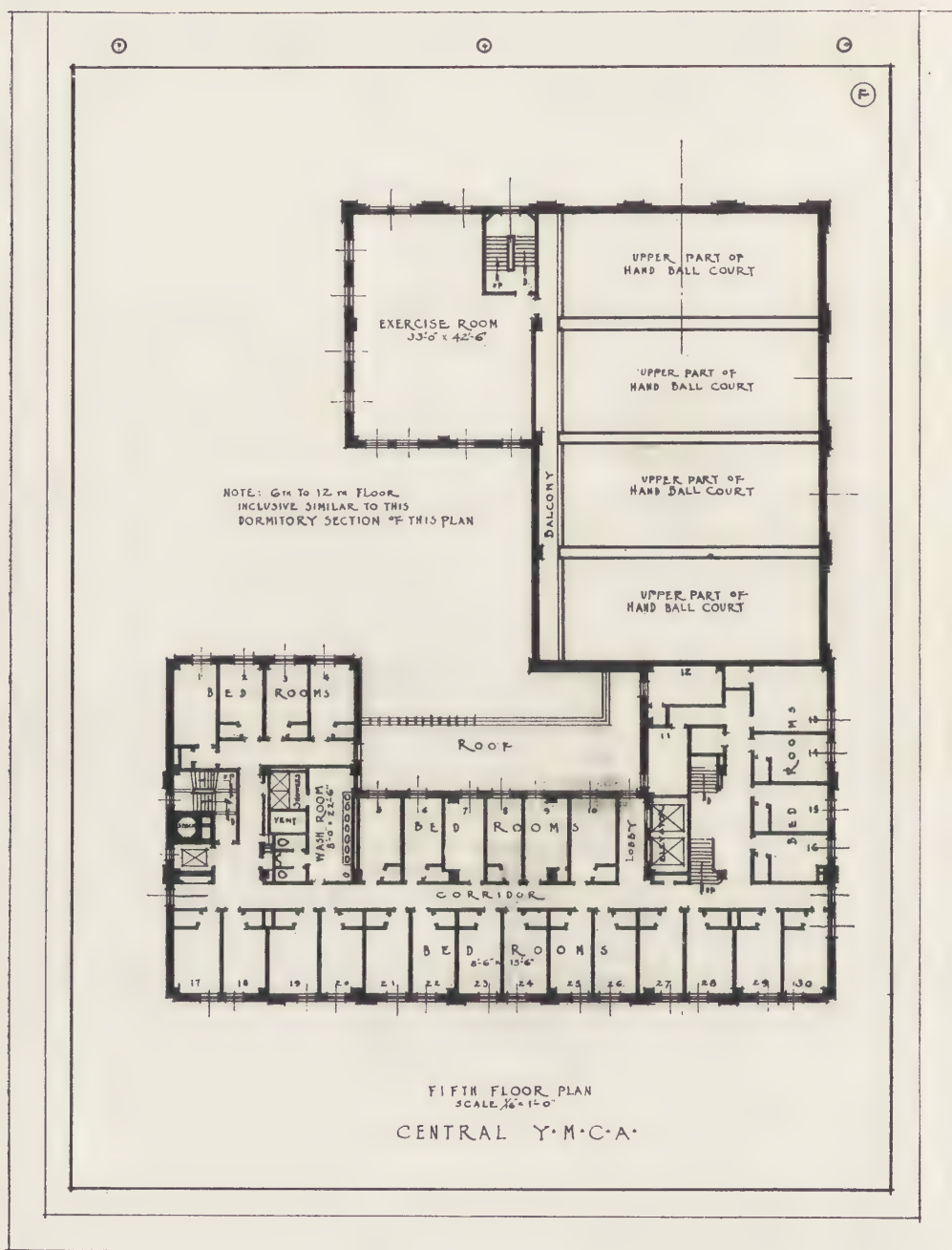
ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.



FOURTH FLOOR PLAN
SCALE $\frac{1}{16}" = 1'-0"$
CENTRAL Y.M.C.A.

LONG LAMOREAUX & LONG
SHATTUCK & HUSSEY Assoc. ARCH'TS

ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.



LONG LAMOREAUX & LONG
SHATTUCK & HUSSEY Assoc. ARCHTS

ONE OF THE MOST RECENT AND BEST
OF THE LARGER CITY BUILDINGS.

enterprise, with this single exception, that throughout the period both architect and owner are entitled to and receive the service of an expert adviser—first on planning, then on construction and operation. Thus, the architect, during the development of his drawings, is furnished with a vast amount of information in the form of standard details, suggestions as to materials and equipment, all with a view to permanence, efficiency and economy in upkeep of the building. Before issuing the drawings for bids, the bureau makes a detailed check in order to eliminate the probability of extras and to make certain of the appropriateness of materials and equipment.

Following the opening of bids, the bureau will share with the architect the rigors of that period of negotiation with low bidders for further economies and final adjustments. At this point also the bureau prepares a detailed statement of the financial aspects in the building operation and the maintenance of the plant, so that the owner may be forewarned of all the liabilities he is incurring. In the past, embarrassment has sometimes resulted from the apparition of legitimate but unforeseen charges.

During construction, the architect

maintains his initiative and supervision over the work. The bureau, in its status as advisory agent for the owner, visits the job several times during its progress, not supplanting but supplementing the superintendence from the architect's office. Upon completion, a final check by the bureau places the stamp of approval by the organization upon the executed contract, so that payment may be prompt upon the architect's final certification.

Under the Full Designing Service, all the activities we have described are carried on in the same way, except for the additional service by the bureau in preparation of the preliminary studies. Even in this case the work is done in close relationship with the architect, and open-minded consideration is given to any alternative scheme which may be suggested. Thus far, however, experience has proven that many an alternative scheme, having apparent advantages, has proved upon analysis to fall short at some vital point; and experience, too, has happily shown both architect and bureau accepting the results of such analysis in a spirit of open-minded co-operation which is the most promising augury for their relationships in the future.

The GOVERNMENT'S HOUSING PROJECT — AT QUINCY, MASS. —

By
Sylvester Baxter

THE Federal Government's project for the housing of industrial war-workers in the Massachusetts city of Quincy is designed for the employees in a single great industry—the Fore River Ship-building Company, a subsidiary of the Bethlehem Steel Corporation. Although relating to a purely ship-building proposition, it at present concerns the Navy Department more than the Shipping Corporation, the Fore River Company being chiefly engaged in the construction of warships, both large and small. Possibly for that reason the greatly needed housing-work here was undertaken by the United States Housing Corporation rather than by the Shipping Corporation.

The Fore River Company has long been one of the leading ship-building concerns of the country, and since the war began the increase in the number of its employees has added enormously to the population of Quincy—one of the most famous historic towns of Massachusetts. Quincy is the home of two families that have long been celebrated in the history of the United States—the Quincys, who gave their name to the town, and the Adamses, who gave it the unique distinction of being the birthplace of two Presidents of the United States, father and son.

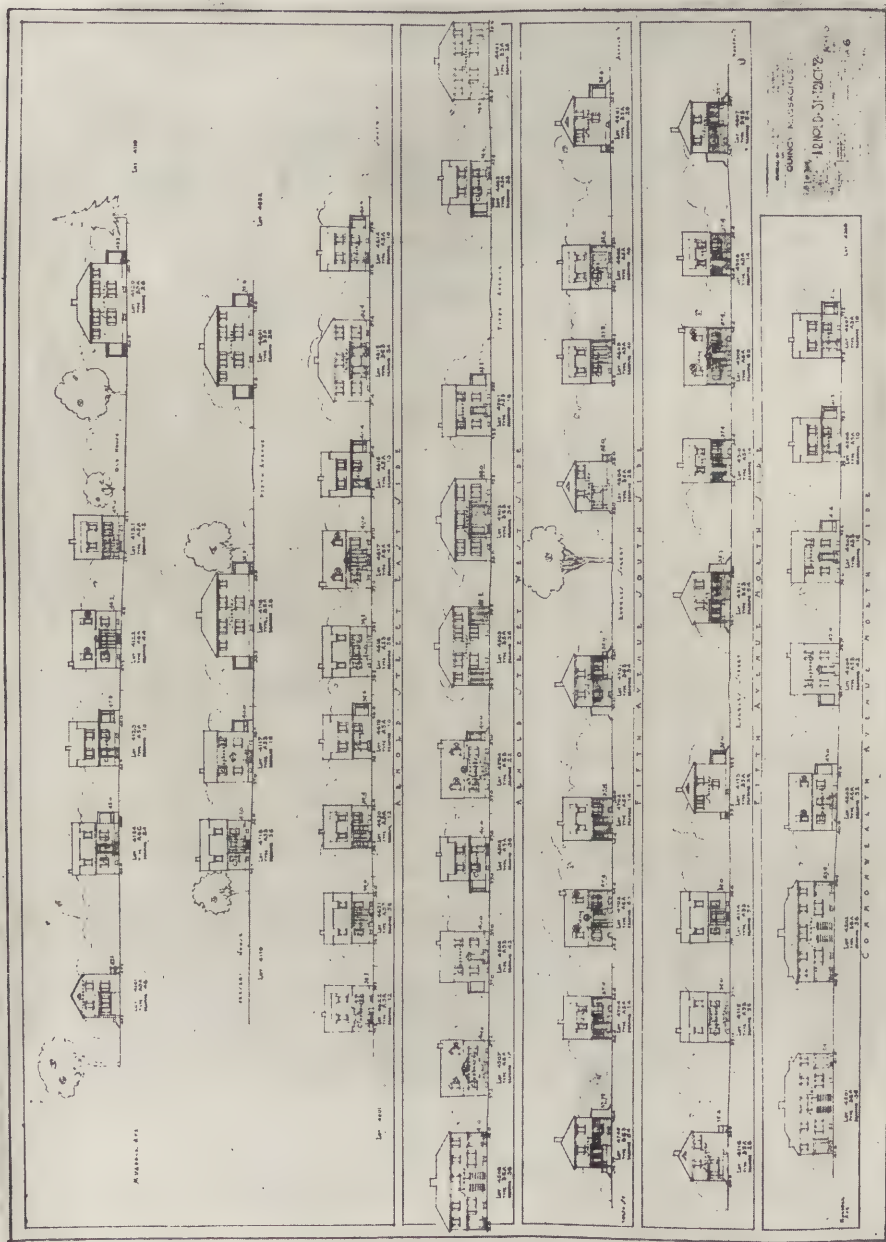
Quincy has long been an important industrial community, as well as a favorite residential suburb of Boston—a constituent part of Greater Boston. Here Gridley Bryant built the first railway in the United States—the Granite Railway, it was called—constructed to carry the stone for building Bunker Hill Monument in Charlestown from the quarries of Quincy to the waterside of the Neponset river. Steam was not used

on the railway until its absorption by the Old Colony Railroad Company late in the 18th century; the cars, loaded with granite, ran by gravitation down-grade all the way to the water and were hauled back light by horses. Bryant, the builder of the railway, was really a great engineer; railway-practice owes to him two fundamental inventions, without which successful operation would be impracticable—the railway-switch, or “points,” as the English say; and the pivot-truck. Architects will be interested to know that Gridley Bryant was father of the prominent architect, Gridley J. F. Bryant, who was one of the leading practitioners in Boston in the third quarter of the nineteenth century. In Boston he was long a partner of the celebrated Arthur Rogers, who designed the Equitable Buildings of New York and Boston and planned the Back Bay district of Boston with its stately thoroughfares. The firm was Bryant & Rogers; together they were authors of the Boston City Hall and the handsome renaissance of the first Horticultural Hall. Later Bryant was responsible for a large proportion of the new business structures erected in the “burnt district” after the great Boston fire of 1872.

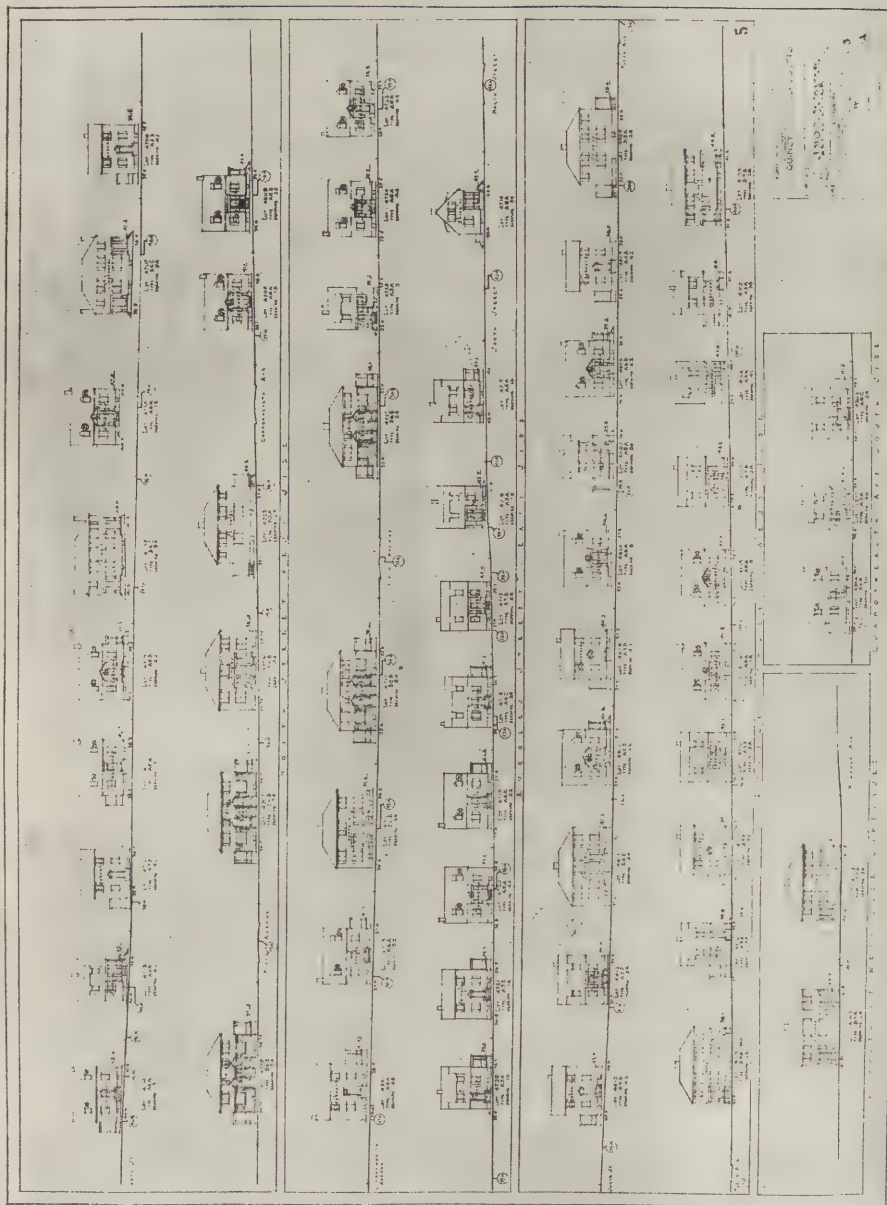
The Granite Railway, in its early days, was one of the great sights for Boston people; so many used to go to witness its operation that a tavern was built at the summit for their accommodation. The granite for the monument, when it reached the water, was transferred to a steamboat that unloaded it in Charlestown. So here were already associated under one management the two great features of modern transportation: the railway and steam navigation. This first American railway is now a part of the



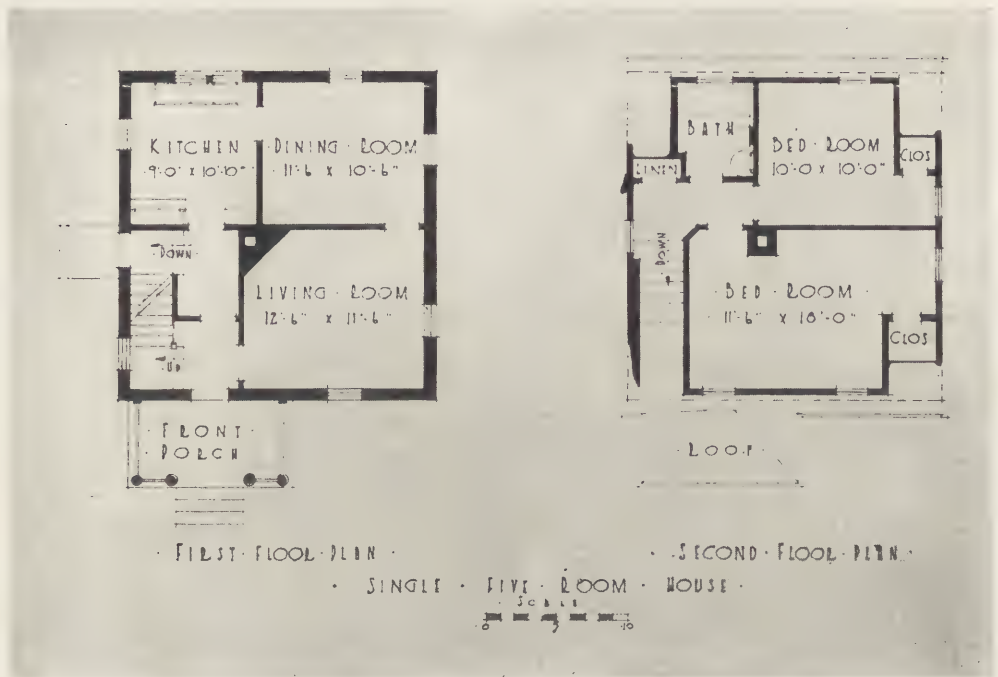
LAYOUT FOR THE ARNOLD STREET DEVELOPMENT WITH 102 HOUSES.
QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



COLLECTIVE ELEVATIONS FOR THE ARNOLD STREET LAYOUT, QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



COLLECTIVE ELEVATIONS FOR THE ARNOLD
STREET LAYOUT. QUINCY HOUSING PROJECT.
JAMES E. McLAUGHLIN, ARCHITECT.



PLANS OF A SINGLE FIVE-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE FIVE-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



PLANS OF A SINGLE FIVE-ROOM HOUSE. (ELEVATIONS ON NEXT PAGE.) QUINCY HOUSING PROJECT.

great New York, New Haven & Hartford system. And since a thing is as old as its oldest constituent part, this makes the "New Haven" the oldest railroad corporation in the United States as Charles Francis Adams pointed out in his monograph on American railways. It is over the "Granite Branch," as this ancient railway is now called, that the workers in the great shipbuilding plant of the Fore River Company usually make their frequent trips to and from Boston.

The granite quarry business, given a new scope by the railway, has ever since been such a leading industry in Quincy that Charles Francis Adams was wont to speak of his native town as "a mining community." But in the early days shipbuilding at Quincy Point and thereabouts, as in Boston and various other localities on Massachusetts Bay, was a great industry. A generation at least had gone by when history began to repeat itself and shipbuilding was revived with the founding of the Fore River Shipbuilding Company by Thomas A. Watson, the associate with Bell in the development of the telephone and one of the six "original Bell Telephone Men" whom the invention made into millionaires—one of the most romantic episodes in the his-

tory of modern invention. The growth of this vast enterprise has made shipbuilding again the great industry of Quincy; so great, indeed, that all others combined, extensive and diversified as they are, sink into insignificance beside it. The Fore River Company, now one of the subsidiary industrial corporations of the Bethlehem Steel Company, ranks with the foremost modern shipbuilding plants of the United States. Its employees and their families represent an addition of perhaps 40,000 persons to the population of Greater Boston. A large proportion of these has overflowed from Quincy into neighboring towns.

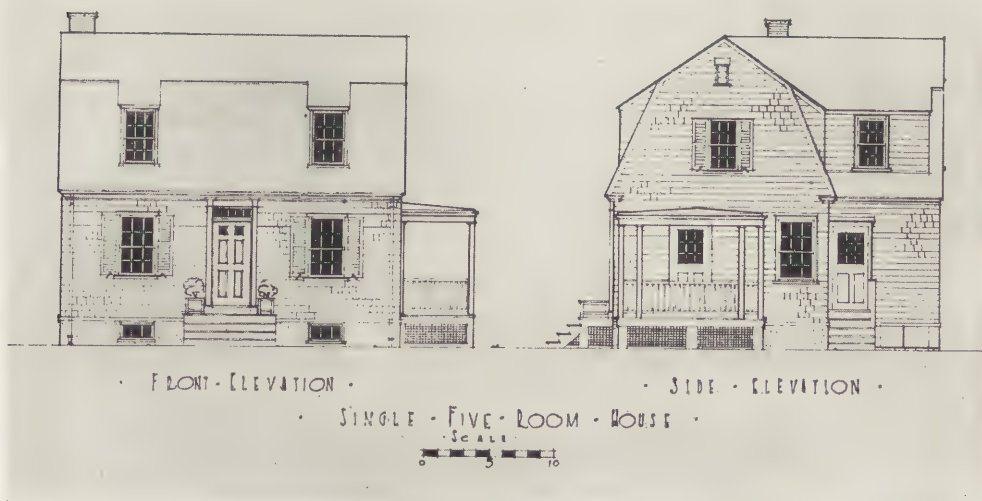
The important part which transit facilities have played in caring for the accommodation of a great portion of this aggregate indicates how well justified is the name of the division of the United States Department of Labor that has charge of the matter: "Bureau of Industrial Housing and Transportation." In the investigation of a housing problem connected with a great war-industry one of the first matters to receive attention was to ascertain to what extent local-transit facilities, or their improvement, could be depended upon to care for the daily movement to and from neighboring

communities where housing could be found.

The Fore River Company has two enormous plants at Quincy: the original one on Fore River, and the "Liberty works" on the peninsula of Squantum, which rose over night, as it were, just across the mouth of the Neponset opposite the Boston shore. With all the thousands of employees at the "Liberty" plant it was not found necessary to develop new housing projects on their particular account, for the reason that the local transit system that serves Boston could rapidly transport the workers between the works and the homes which they could find in widely scattered sections of the widespread metropolitan territory of Greater Boston. The city of Boston built a bridge across the river, and over this a new line of the surface trolley system of the Dorchester district was constructed—connecting quickly with the new tunnel and subway route that had only just been opened—a route extending the Cambridge subway into Dorchester. By means of this huge transit system workmen at the Fore River Company's "Liberty" works (devoted to the building of destroyers for the navy) could leave their homes in the northern suburb of Malden, something like ten miles away,

and proceeding by connecting surface lines, elevated, tunnel and subway routes, with three changes of cars, reach their work in an hour. And all for one fare. This demonstrates how immensely important an efficient local transit system is to the well-being of a great industrial community that has been developed on the principle of mobility of population. Unhappily, with the piling up of expenses our local transit systems are now degenerating swiftly into inefficiency. For instance, the fare unit in Boston has been jumped from five cents to eight, while the quality of service has depreciated perhaps another 60 per cent.

Had the war kept on, a housing problem in connection with the Liberty works would doubtless also have arisen. But as it turned out the project for accommodating the workers at the Fore River plant proved the only one to be taken in hand. Local conditions here have been uncommonly favorable for the development of a model housing project within a few minutes' walking distance of the works. The employees are of a high grade of skilled workers, well paid, and requiring a correspondingly high grade of dwellings—attractive without and within. Fortunately this element of attractiveness existed in nature to an ex-



ELEVATIONS OF SINGLE FIVE-ROOM HOUSE. (PLANS ON PREVIOUS PAGE.) QUINCY HOUSING PROJECT.

James E. McLaughlin, Architect.



LAYOUT FOR THE BAKER BASIN DEVELOPMENT,
WITH 117 TWO-FAMILY HOUSES, QUINCY HOUSING
PROJECT. JAMES E. McLAUGHLIN ARCHITECT.



LAYOUT FOR THE RIVER STREET DEVELOPMENT, WITH 36 SINGLE AND SEMI-DETACHED HOUSES. QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



ELEVATION OF SEMI-DETACHED SIX-ROOM HOUSE. (PLANS ON NEXT PAGE.) QUINCY HOUSING PROJECT.

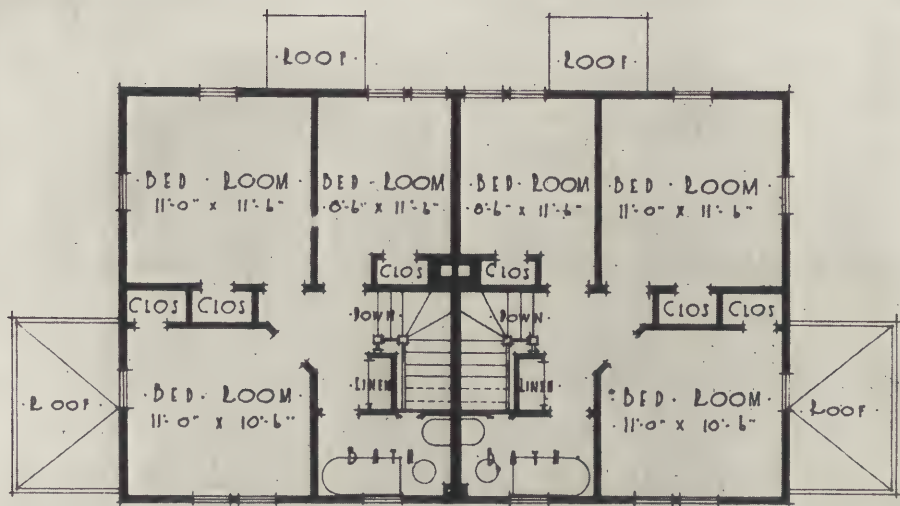
ceptional degree. Quincy, like so many other suburban municipalities of Greater Boston, covers a widespread and highly diversified territory, from the near mountain scenery of the wild Blue Hills to an extensive waterfront. Along a large portion of this waterfront the waters of Boston Bay are so shallow as not to be available for commercial development. When Boston's famous metropolitan park system was developed this fact gave opportunity for the planning of a fine parkway along the Quincy shore, with connections for the Blue Hills and the Neponset valley. With the growth of motor-vehicle traffic and the consequent congestion of the ordinary highways leading into southeastern Massachusetts—the Old Colony region—there came a demand for a special pleasureway to accommodate it. This need has been realized by the construction of the new Old Colony Parkway in Boston as a part of the Metropolitan system, leading out of the heart of Boston along the Dorchester shore to a connection with this fine drive along the Quincy shore; the line of pleasure-traffic is planned to be further continued by what is known as "the Pilgrim highway," a beautiful new State road now partially completed along and near the shore through the several towns of the South Shore region towards Plymouth and Cape Cod.

The developments of the Quincy housing project are happily located in sections near this great artery of travel, and one

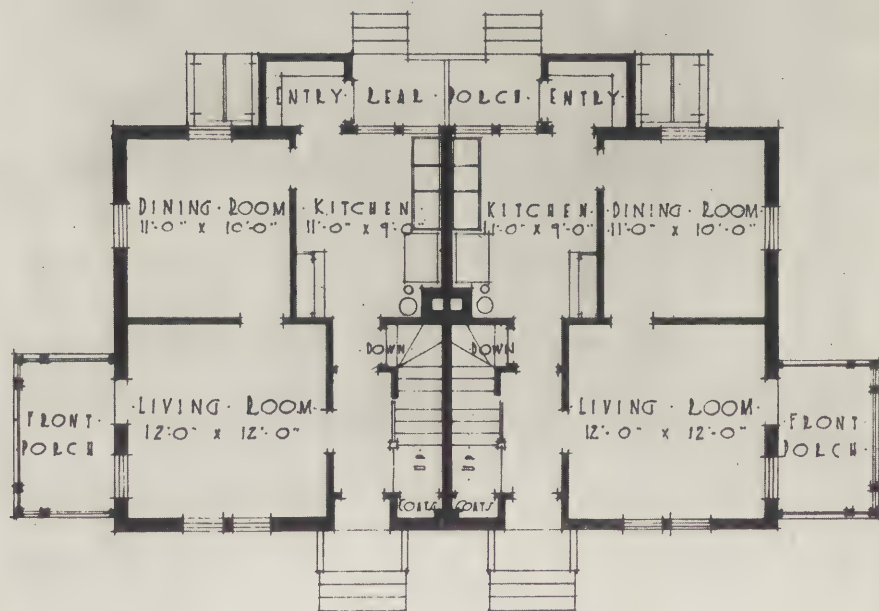
through which the proposed parkway has been so planned as to take excellent advantage of the circumstance. Weymouth Fore River, on the Quincy shore of which is located the great Fore River plant, is a picturesque estuary that makes in from Boston Bay, or that landlocked portion of it known as Hingham Bay. Its shores have their due share of the varied charm of New England coast scenery, and the contrast presented between the gigantic industrial development of the ship-building plant, spread over many acres, and the pleasant landscape of the region round about, is not at all displeasing.

The committee of designers appointed by the United States Housing Corporation to take charge of the Quincy project consists of James E. McLaughlin of Boston, architect; H. J. Kellaway, of Boston, town planner; and Ernest W. Branch of Quincy, engineer. Mr. McLaughlin has to his credit the monumentally handsome design of the huge Commonwealth Armory in Boston, built for the local cavalry unit of the Massachusetts State Militia and National Guard, which as a portion of the heroic 26th division distinguished itself in the War. Mr. Kellaway worked as town planner for the cantonment division of the War Department on the layout of Camp Devens.

Before the war the growth of the Fore River Works had caused an extensive building-over of the neighborhood with a



• SECOND FLOOR PLAN •

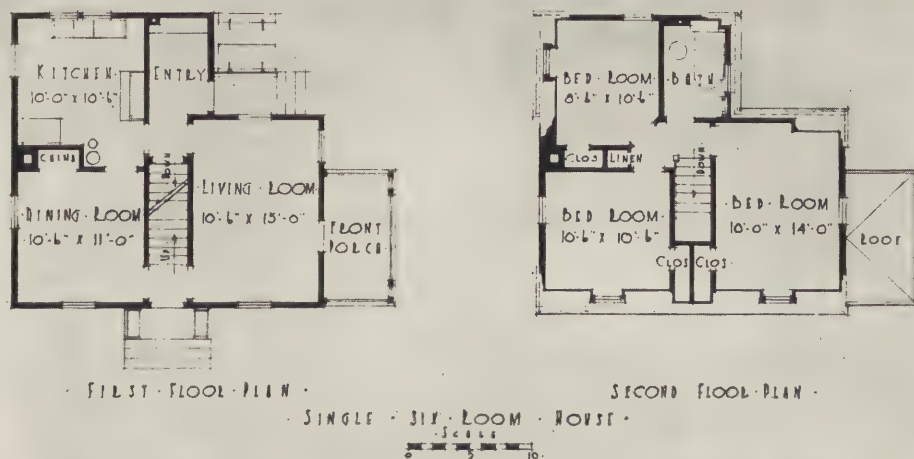


• FIRST FLOOR PLAN •

• SEMI-DETACHED SIX-ROOM HOUSE •



PLANS OF SEMI-DETACHED SIX-ROOM
HOUSE. (ELEVATIONS ON PRECEDING
PAGE.) QUINCY HOUSING PROJECT.
JAMES E. McLAUGHLIN, ARCHITECT.



PLANS OF SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.

good class of dwellings, but various tracts round about were still unoccupied. Three excellent sites, all within a few minutes' walk of the works, were selected. Good schools had been established by the city near by but were already well filled. Sufficient local trading facilities were handy, however, and the Fore River Club, a capital recreation centre established by the workers, was close at hand. So, except for additions to the schools and to the hospital, there was little call for expenditures for the various community needs of the population. For outdoor recreation the great metropolitan park system, together with the local pleasure-grounds of Quincy, supplied a large measure of the needs in this respect. But in planning what is called the "Baker's Basin Tract" an excellent playground, Whiton Park, was made a feature, while the attractive frontage on Town River Bay, that had been in use for the building, repair and winter-storage of yachts, was reserved for recreation uses as a waterfront park with facilities for bathing and boating. Mr. Kellaway's extensive experience as a landscape architect in the development of important park and parkway projects—including a most admirable scheme for still further enhancing the charms of the almost model residential Greater Boston town of Win-

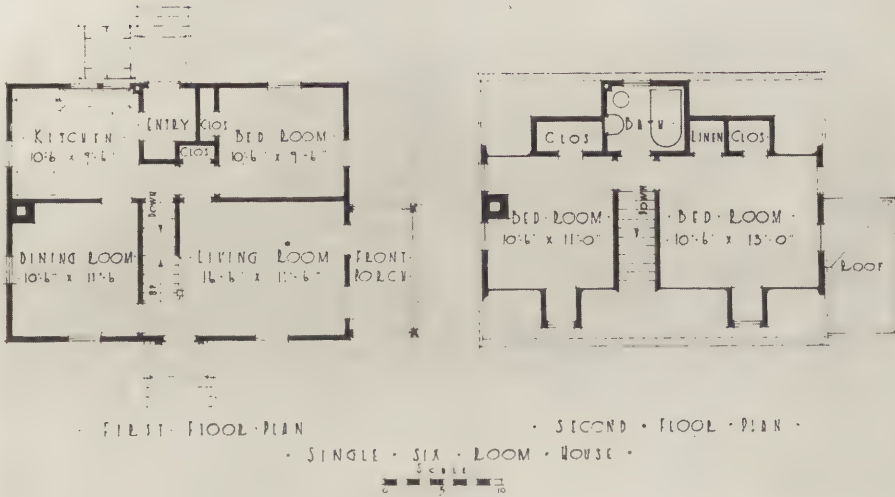
chester—here stood him in good stead, in so planning his layouts as to carry a connection with the Metropolitan Parkway system quite effectively through the property. This "Pilgrim Parkway," as Mr. Kellaway appropriately calls it, forms a valuable link between the Metropolitan system's Quincy Shore Drive and its continuation in the Pilgrim highway, just built by the State along the South Shore, as aforementioned.

These three developments fit harmoniously in with the built-up sections in the midst of which they are placed—all being typical of a prosperous middle-class population, pleasantly housed. The entire project comprises 256 separate houses, all told. Of these, 90 are single houses, 57 semi-detached, and 109 two-family houses. Housing accommodations for 422 families are thus provided for. Most of the houses have five rooms; some have six rooms, and one type, designed for uncommonly large families, has eight rooms. The semi-detached houses, as a rule, have five and six rooms; the flats in the two-family houses have four and five rooms. The four-room flats are designed with convertible rooms, so as to provide two chambers, if desired, by making one room serve as living and dining room in common.

The lots average about 5,000 square



SEMI-DETACHED HOUSES ON WHITON
PARK. QUINCY HOUSING PROJECT.
JAMES E. McLAUGHLIN, ARCHITECT.



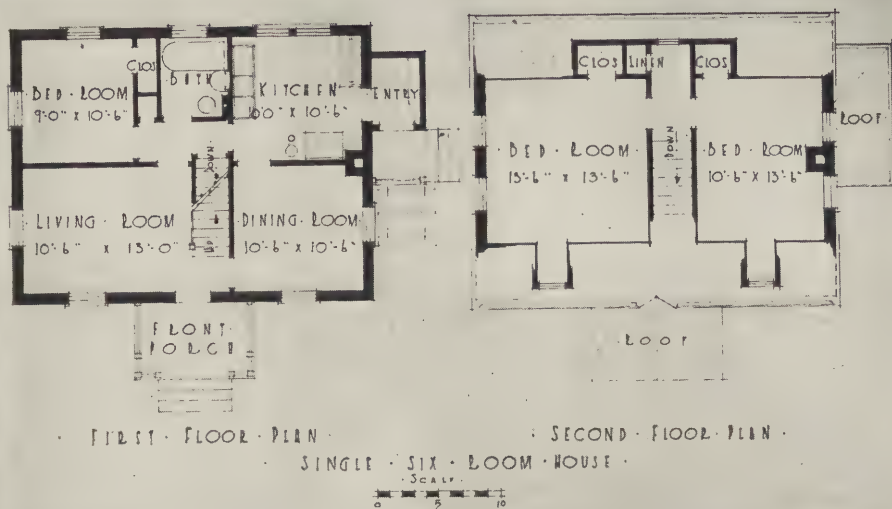
PLANS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



SINGLE HOUSES OF BRICK ON FIFTH AVENUE. QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



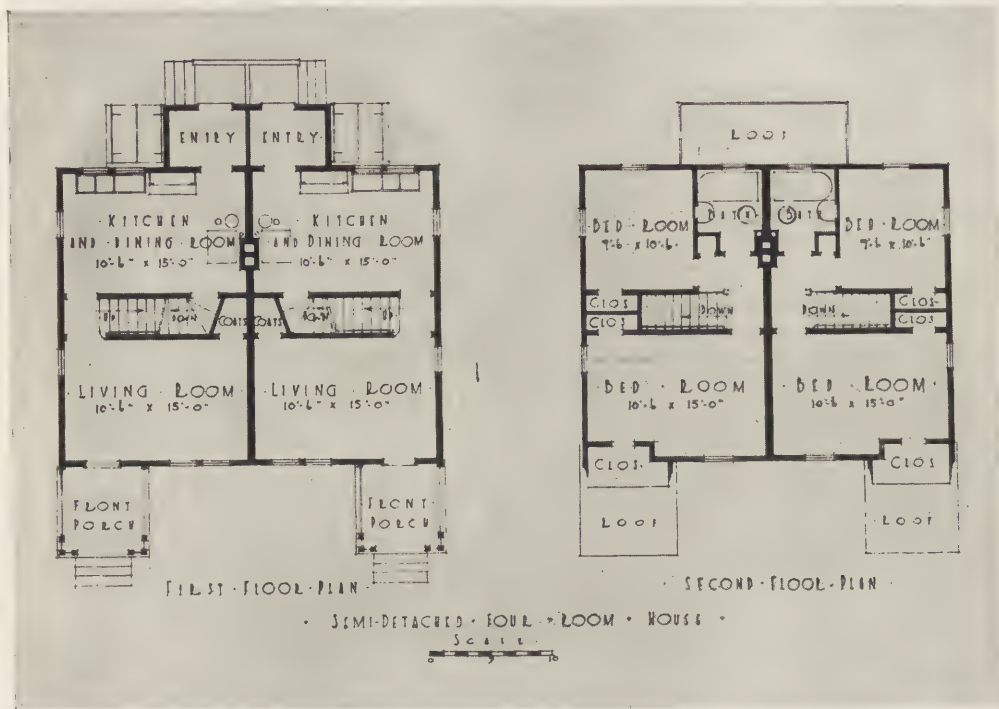
PLANS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



PERSPECTIVE OF THE WATER-FRONT ON AVALON STREET,
 FACING THE WATER-FRONT RECREATION GROUND
 ON TOWN RIVER BASIN. QUINCY HOUSING PROJECT.



PLANS OF SEMI-DETACHED FOUR-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.



ELEVATIONS OF SEMI-DETACHED FOUR-ROOM HOUSE. QUINCY HOUSING PROJECT.
James E. McLaughlin, Architect.

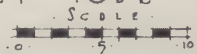


• FIRST FLOOR PLAN •



• SECOND FLOOR PLAN •

• TWO FLAT FOUR ROOM HOUSE •



PLANS OF TWO-FLAT FOUR-ROOM HOUSE.
(ELEVATIONS ON NEXT PAGE.) QUINCY HOUSING
PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



ELEVATIONS OF TWO-FLAT FOUR-ROOM HOUSE. (PLANS ON PRECEDING PAGE.) QUINCY HOUSING PROJECT.

feet; the minimum set-back of the houses is 15 feet. The minimum distance between houses is 16 feet, but it is usually 20. One excellent feature is the placing of the houses so that each gets the sunlight in every room at some time of the day. Nearly all the chambers have windows on two sides; no chamber is without two windows. The heating is by hot-air furnace, with the pipes of extra size and ample enough so that there can be no question as to sufficient heat. In every kitchen there are double laundry-trays. Through the winter hot water is provided from a coil in the furnace which keeps the boiler well supplied; for summer use an instantaneous gas heater is provided. Gas is the fuel for cooking; the lighting is by electricity. In the kitchen, bathroom and in one bedroom of each house there is a plug-socket for attaching a pneumatic cleaner and other electric conveniences.

The houses are of frame construction, or brick. The frame houses are painted either white or a very light gray, with green blinds. There is no hint in any of these cheery, new streets of the dull mon-

otony that characterizes the average locality where the cheap contractor has cast his blight upon the scene. Neither is there any suggestion of the uneasy striving for originality, where each house seems to be crying out: "Here I am! Just look at me!" With several standard types of plan in common, the architectural expression obtained from these has been brought out in what seems to be a practically infinite diversity in design, obtained by variations in surface treatment, color, form of porch, etc. For instance there are two types of five-room houses, and each type has three different elevations. By distributing these judiciously among the streets and making slight changes in detail features, all danger of tedious uniformity is avoided.

The various types of dwelling have all been designed for obtaining the greatest practicable economy in construction through careful consideration as to height of rooms, etc., so that the timbers and floor-joists could be cut in even lengths. There is but one contractor for the construction of the entire project.

MODERN INDUSTRIAL PLANTS



By George C. Nimmons

PART V.

THE GREAT ARMY SUPPLY BASES AND QUARTERMASTERS' TERMINALS OF THE UNITED STATES GOVERNMENT CONSTRUCTED ALONG THE EASTERN COAST FOR WAR PURPOSES.

THE next subject in the discussion of Modern Industrial Plants, according to the outline published in part II of the December issue of THE ARCHITECTURAL RECORD, was to have been the "Turnover of Labor" and the features in industrial plants that have been found effective in reducing it. An opportunity, however, has come since that article was published, to describe and illustrate the great port terminals, which will now take precedence over the question of labor turnover.

When this country entered the war and decided to do its part in the great world struggle, it thereby imposed upon itself in the way of a building industry, the biggest, if not the most difficult undertaking with which it has ever been confronted. Few people realize that the raising, training, equipping and transporting of an adequate army and its supplies, involved immediate building construction on a scale and at a speed such as never had been attempted or accomplished in the world before.

This country had practically nothing adequate in the way of training camps, arsenals, warehouses, wharves, piers, port terminals, aviation fields, proving grounds, hospitals, embarkation camps, engineer camps, gunnery schools, munition plants or housing for employees. All of these had to be built in an incredibly short time in order that America might take part successfully in the war.

The task of building the cantonments was intrusted to the Cantonment Division

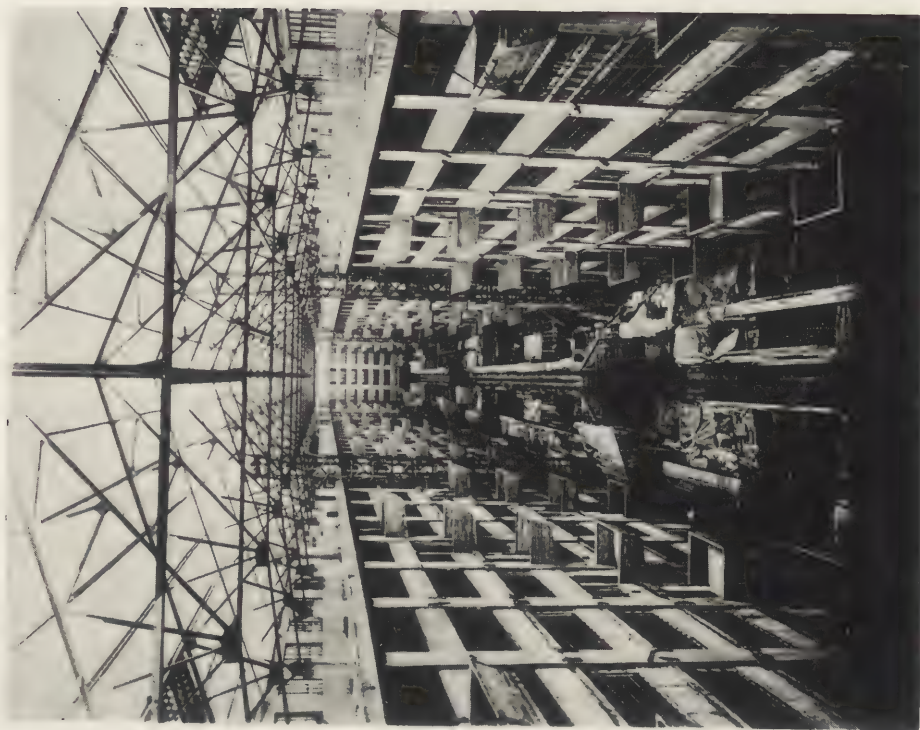
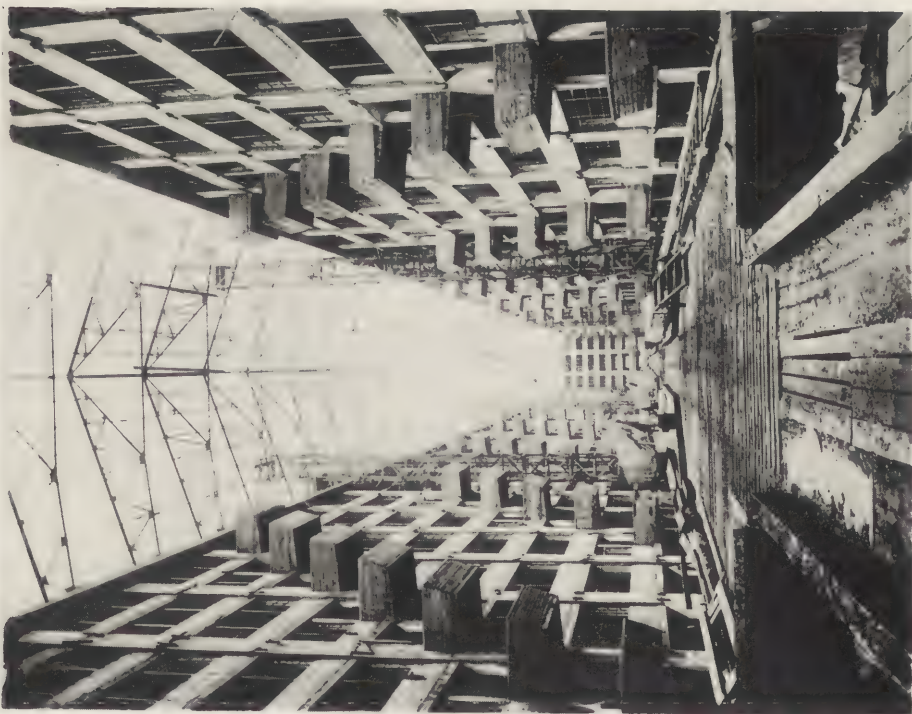
under Brig. General Littell. In the winter of 1917, Gen. Littell was worn out and was relieved, and the scope of the work was enlarged to cover all construction work for the Army in this country and the name changed to the Construction Division of the Army in charge of Brigadier General R. C. Marshall, Jr. A diagram showing the principal officers, their relative authority and division of the work is given.

The extent of the work done has included construction in every state of the Union but one. It will have cost when completed in the neighborhood of a billion dollars, and have involved the employment of two hundred and fifty thousand workmen at one time.

The 16 cantonments and 16 National Guard Camps, which were needed first for housing and training the drafted men, were great military cities, each one accommodating about fifty thousand soldiers. Each of these was built out in the open country in about three months time, complete with hundreds of buildings, new streets, sidewalks, sewers, electric lights, heating plants, mess halls, drill grounds, hospitals, administration buildings and various other structures.

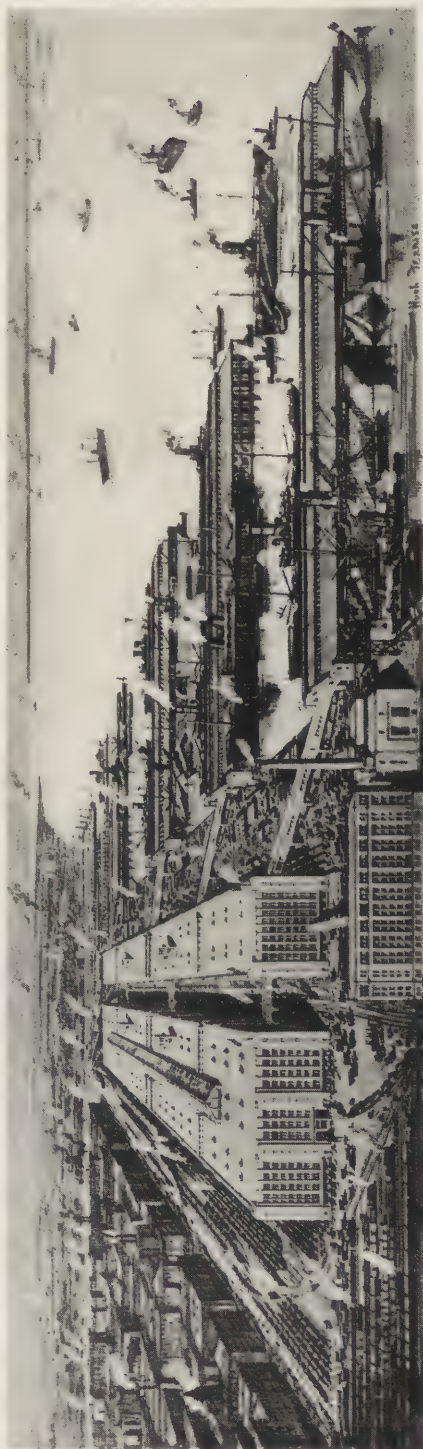
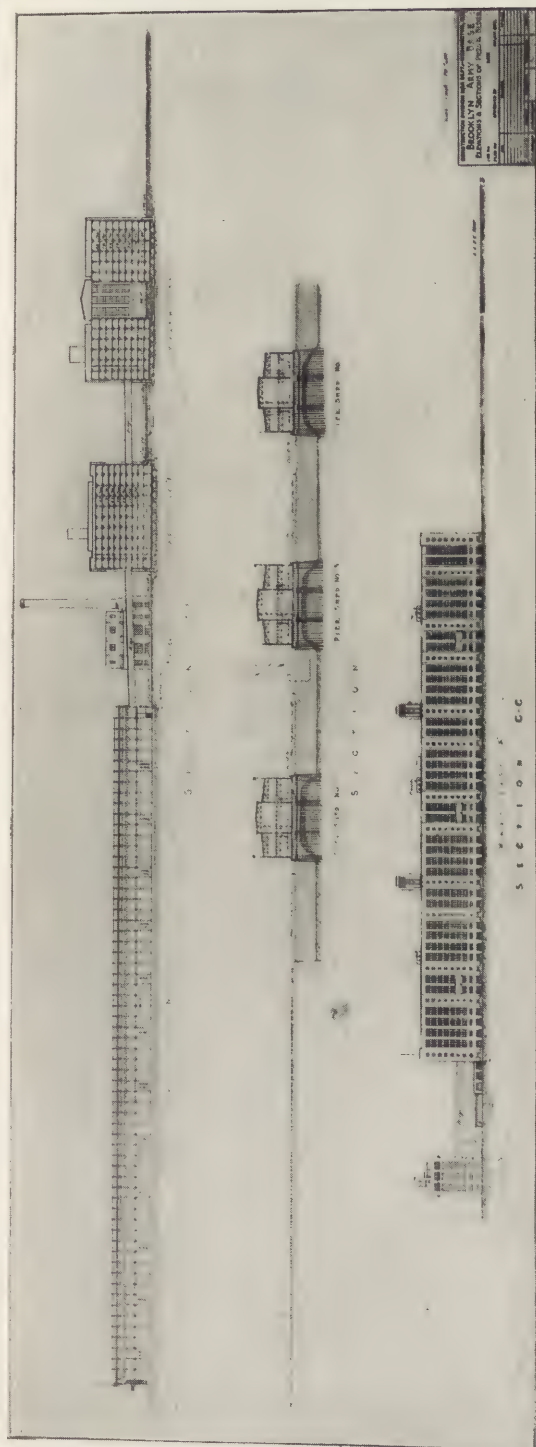
The cost of these cantonments, together with the cost of the National Guard camps, was in the neighborhood of two hundred million dollars.

This construction work, together with other camps and those for special training and embarkation, brought up this country's capacity for turning out sol-



BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.

Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.
Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.
Cass Gilbert, F.A.I.A., Designing Architect.
Turner Construction Company, New York, Contractors.



ELEVATION AND PERSPECTIVE OF BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.
 Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.
 Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.
 Cass Gilbert, F.A.I.A., Designing Architect.
 Turner Construction Company, New York, Contractors.

diers from practically nothing to two million two hundred and fifty thousand men at one time.

Emergency warehouses, terminals and transportation facilities grew up in all parts of the country from the efforts of the Construction Division in a correspondingly short space of time, including permanent fireproof storehouses. The latter buildings, six to eight stories high, thoroughly fireproof and modern in every particular, containing as they did over a million and a half to four million square feet of storage space in each, were completed in some instances sufficiently for occupancy in five months, when such buildings ordinarily would take from twelve months to two years to build.

Notwithstanding the difficulties of getting sufficient labor and materials, and the delays in railroad transportation which was already overcrowded with shipments of fuel and all the various war supplies, the records made in the speed of construction far excelled any previous showing. One of the most spectacular performances of the Division was the erection of a forty bed hospital unit. This unit was much needed in an emergency and as a result of the speeding up of all the operations for an extreme effort, the building was actually erected and completed, ready for the beds, in just ten hours and thirty-eight minutes.

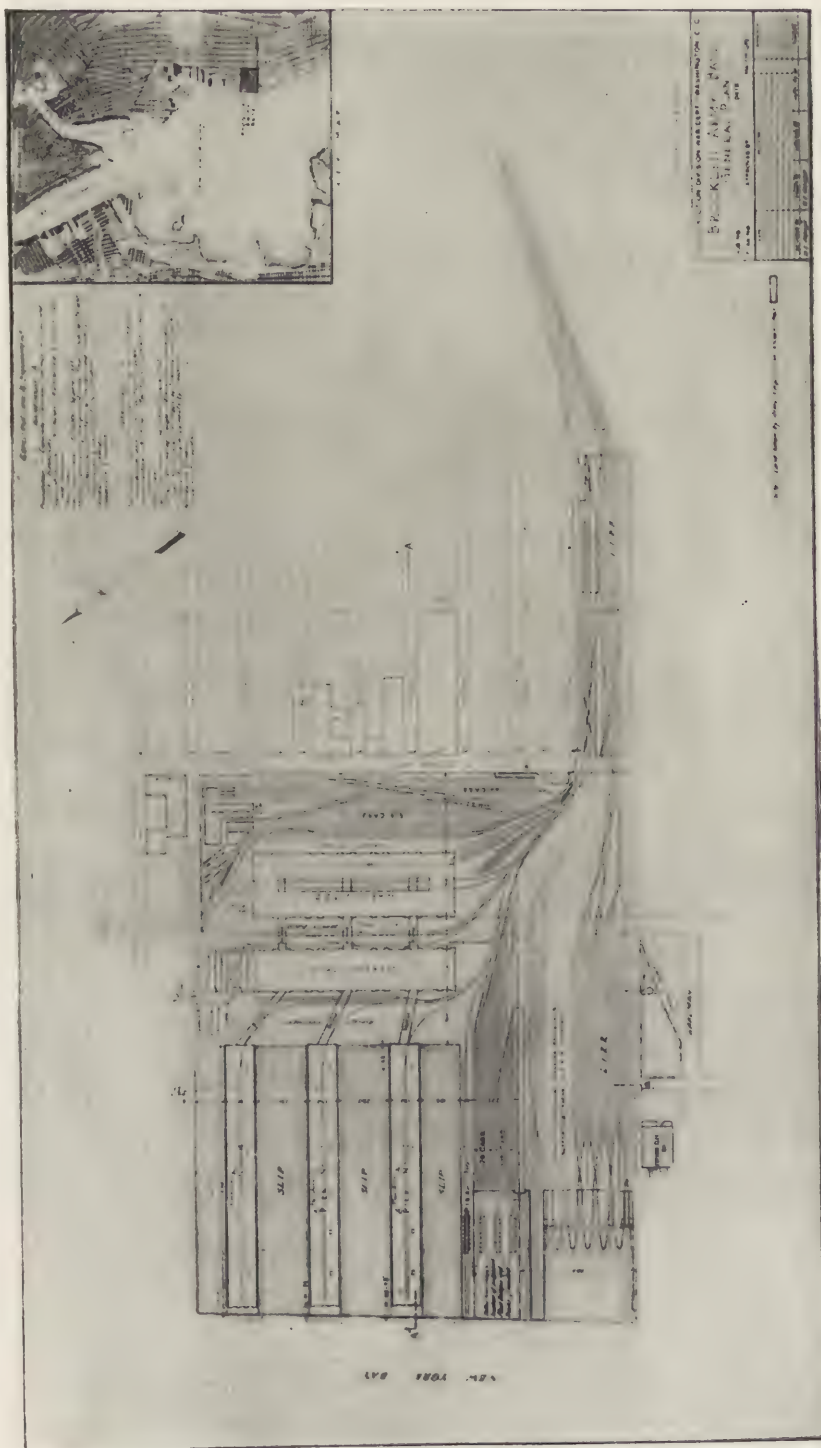
The reason that the Construction Division succeeded in accomplishing such wonderful results was owing to the fact that it drew to its organization the best and most capable engineering and executive talent in the country who had been instrumental in building up the industrial and commercial life of the nation and who found that in this organization they could work along lines to which they were accustomed. These men worked days, nights and Sundays, and were able and patriotic throughout all the field of their operations. The builders and the workmen imbued with the same spirit and loyalty felt that by doing their best they were helping to win the war. Friendly competitions for speed and the passing of the hat for funds for a flag raising were not uncommon among the humblest of the workmen. Things went with a dash

and the men moved and worked in a way they never do under ordinary conditions.

The work on the hospitals, aviation camps, gunnery schools, factories, housing for workmen and all the various other buildings was carried on in a similarly successful manner. Many of these projects are of particular interest, especially the villages erected for workmen, which already have established new standards and new ideas for housing employees that will permanently benefit the industries of America.

In connection with all this speed and efficiency on the part of the Construction Division, the question of the cost of work to the Government naturally arises. Speed, of course, was a matter of life and death to the nation, as there was plenty of evidence finally produced to show that America was in danger of foreign attack. Almost any necessary expense in building construction therefore that would have enabled this country to prepare in time for its proper defense, would have been justified. Notwithstanding this extreme need for haste, the Construction Division did not lose sight of the necessity for the strictest possible economy under the circumstances, and their contracts and obligations for building construction were therefore made with all the vigor and skill that it was possible to bring to bear. The result was that no contractor received a contract by which he would make anything like the profit which he would ordinarily make in his regular business. The men who did reap a larger return from war work than on private work before the war, were the workmen, craftsmen and mechanics. This increased income did not as a rule take the form of larger wage for the regular work hours (although most of the trades did raise their wages to some extent during 1918), but consisted chiefly of overtime and bonuses for work after the regular hours and for work that was either not attractive or in which there was a scarcity of labor—the reason for this scarcity being of course the higher cost of living.

Contractors and material men, who could afford to pay the higher cost of living, were called upon to work for their

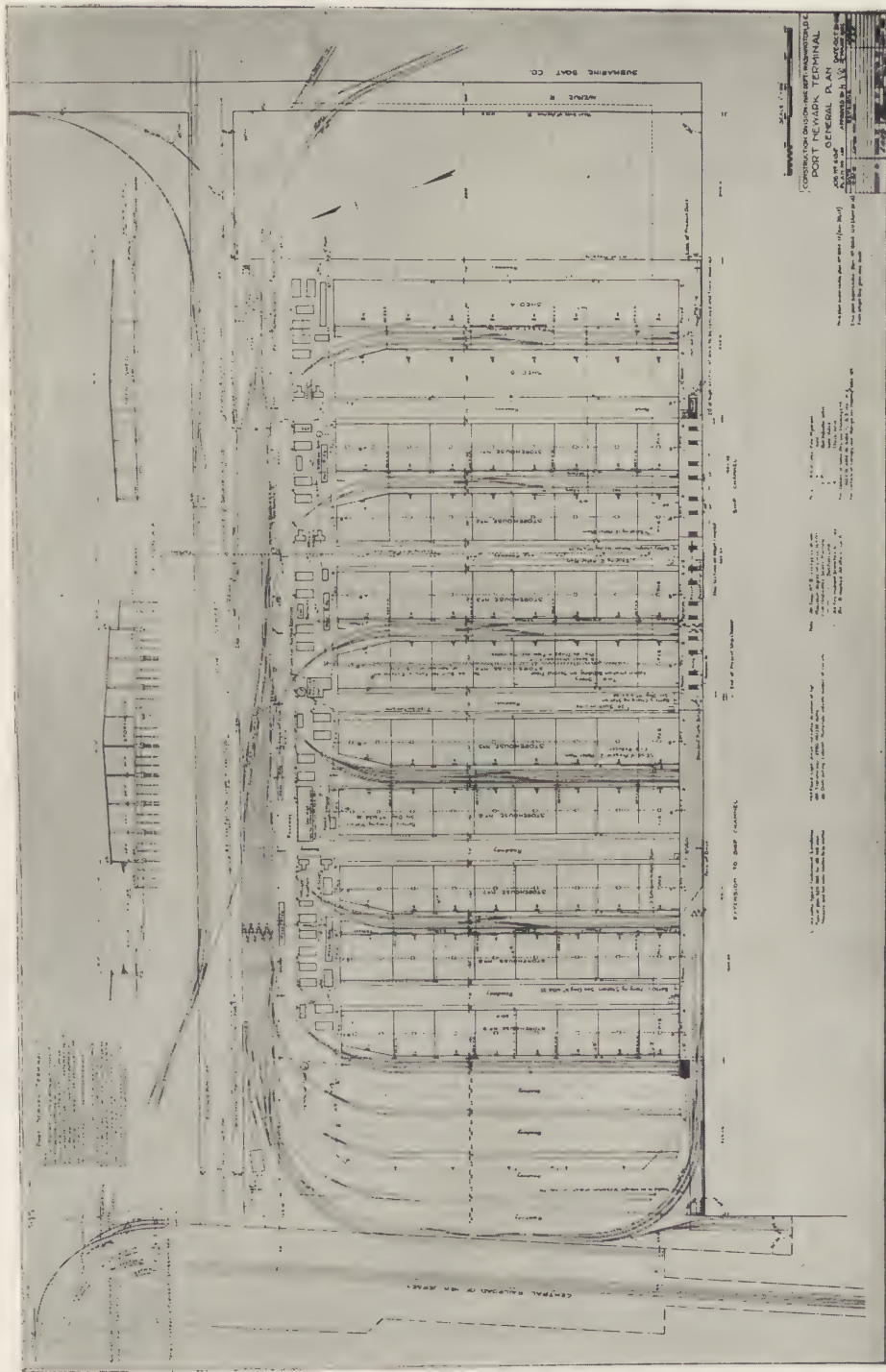


BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.
 Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.
 Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.
 Cass Gilbert, F.A.I.A., Designing Architect.
 Turner Construction Company, New York, Contractors.



CHARLESTON PORT TERMINAL
 CHARLESTON, S. C.
 COL. F. E. LAMPHERE, CONSTRUCTING QUARTERMASTER
 MASON CHANDLER CONTRACTING CO., GEN. CONTRACTORS
 OFFICE OF W. E. GROVE, PRIN. ASST. ENGINEER.

CHARLESTON QUARTERMASTER TERMINAL, CHARLESTON, S. C.
 Col. F. E. Lamphere, Constructing Quartermaster.
 Lieut. Col. J. L. Calvert, Supervising Constructing Quartermaster.
 Mason and Chandler Contracting Company, Contractors.
 W. E. Grove, Prin. Asst. Engineer.



PORT NEWARK QUARTERMASTER TERMINAL, NEWARK, N. J.
 Col. F. E. Lamphere, Constructing Quartermaster.
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.
 Clarence Healy, Consulting Engineer.
 McArthur Brothers and Mason & Hanger Company, Contractors.



NORFOLK VIRGINIA QUARTERMASTER TERMINAL, NORFOLK, VIRGINIA.

Col. M. A. Butler,
Constructing Quartermaster.
Lieut. Col. L. L. Calvert,
Supervising Constructing Quartermaster.

A. O. Leach,
Supervising Engineer.
Porter Bros.,
Contractors.

Government at a very low rate—or at least as a rule did so.

To give some idea of these building contracts and the amount of profits realized, the cantonment contracts may be cited. The Division realized in the first place that the building of these cantonments was a new proposition, often removed from direct connection with railroads, sources of materials and labor, and surrounded often by unfavorable conditions which would cause anyone to figure high who sought to secure the work by a fixed sum bid. The unsettled conditions of labor, the material market, transportation and the great speed demanded, were causes alone which would lead to the addition of large sums for contingency and risk in any contract they would be able

to let under the old system of competitive bids.

The Division therefore very wisely decided that it would be true economy for the Government to carry this risk, by paying to the contractor an agreed sum determined on a sliding scale for his profit plus the exact cost of the work, which was easily recorded and checked by the methods adopted.

As an example, the contract for a single cantonment may be taken. Assuming that this cost ten million dollars, the contractors profit including certain overhead expense, would be two hundred and fifty thousand dollars—just two and a half per cent. of the cost of the work. The overhead expense to the contractor would run about one hundred thousand dollars,

leaving one hundred and fifty thousand net, which, when his income tax and excess profit taxes of last year had been deducted, would leave him just about sixty thousand dollars to divide up among the several members of his firm or company for doing a ten million dollar job. Any criticism of such a showing can readily be met by realizing that a contractor could have taken his capital involved in such operations and invested it far more safely, and comfortably in securities or in Government bonds, with a much larger resulting profit.

The criticism that workmen and mechanics loaf on any job where their boss is not responsible for its cost, can be refuted by the records, which show that such speed of construction has never been equaled in this country.

The many and diverse projects of the Construction Division are full of interest and all played an important part in the

outcome of the war. Now that it is over and the work done by the different departments of the Government is being examined and scrutinized for the real and authentic records of history, the value of the service performed in each case will undoubtedly be determined by whether or no it resulted in providing its product to the soldiers who went over to fight in the trenches. Were the things they needed produced, or was there a reasonable excuse for not completing some of the things which they did not get?

The boys may not have had their letters and packages delivered to them, nor adequate ammunition, guns or flying machines from this country; but they did have here their comfortable and sanitary living quarters, training camps, the warehouses for their food and supplies, and all the buildings necessary for them to accomplish what they did.

By reason of this fact alone the Con-



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Porter Bros.,
Contractors.



TWO VIEWS OF THE NORFOLK VIRGINIA QUARTERMASTER TERMINAL,
NORFOLK, VIRGINIA.

Col. M. A. Butler,
Constructing Quartermaster.
Lieut. Col. L. L. Calvert,
Supervising Constructing Quartermaster.

A. O. Leach,
Supervising Engineer.
Porter Bros.,
Contractors.

struction Division, the contractors, material men, workmen and all the craftsmen who erected these buildings in such a short time, are justly entitled to the gratitude of all the people of this country, and to a wide recognition of the fact that they did make good and contribute their full share towards winning the war.

When all of the reports are compiled and the final history written of all of the projects of the Construction Division, it will make a valuable and interesting record to refer to if this country should ever again be called upon to go through with an undertaking such as this war required.

This article, however, is concerned chiefly with the new port terminals. It so happens that this subject also has the greatest interest now, because many of the large terminals were built with the double purpose in view of fulfilling an urgent need for the war and a most important use in peace times as well.

The port terminals which existed in this country before the war were hardly sufficient to take care of such shipping and transportation as existed at that time, and the docks and piers as well as the railroads connected with them, were as a rule of such a character and in such condition, as to make impossible the efficient, prompt and satisfactory handling or shipment of goods and products—the docks were often in a more or less dilapidated condition and possessed few modern appliances for handling goods. As a result of this inadequacy the railroads became choked up at the port terminals, which acted like dams or obstructions in the great flow of materials to the seaboard, and shipments were sometimes blocked up or stalled all the way from New York back to Pittsburg. This condition tied up the use of freight cars and railroad equipment far beyond the time usually required for such shipments, and the coal famine of the following winter was one of the many serious results.

The new port terminals which the Construction Division built and are still completing in some few instances, were an absolute necessity for the war.

There is, undoubtedly, no one feature of our great railroads which is as inefficient and far behind the times as their freight terminals. The largest proportionate expense in operation is incurred, and the greatest delay and tie up of freight cars is occasioned at these terminals, because of the lack of efficient means or methods of handling goods.

In the new terminals, however, erected by the Government, many of the faults of the old transportation terminals have been eliminated, and provisions have been made for prompt and efficient handling of freight.

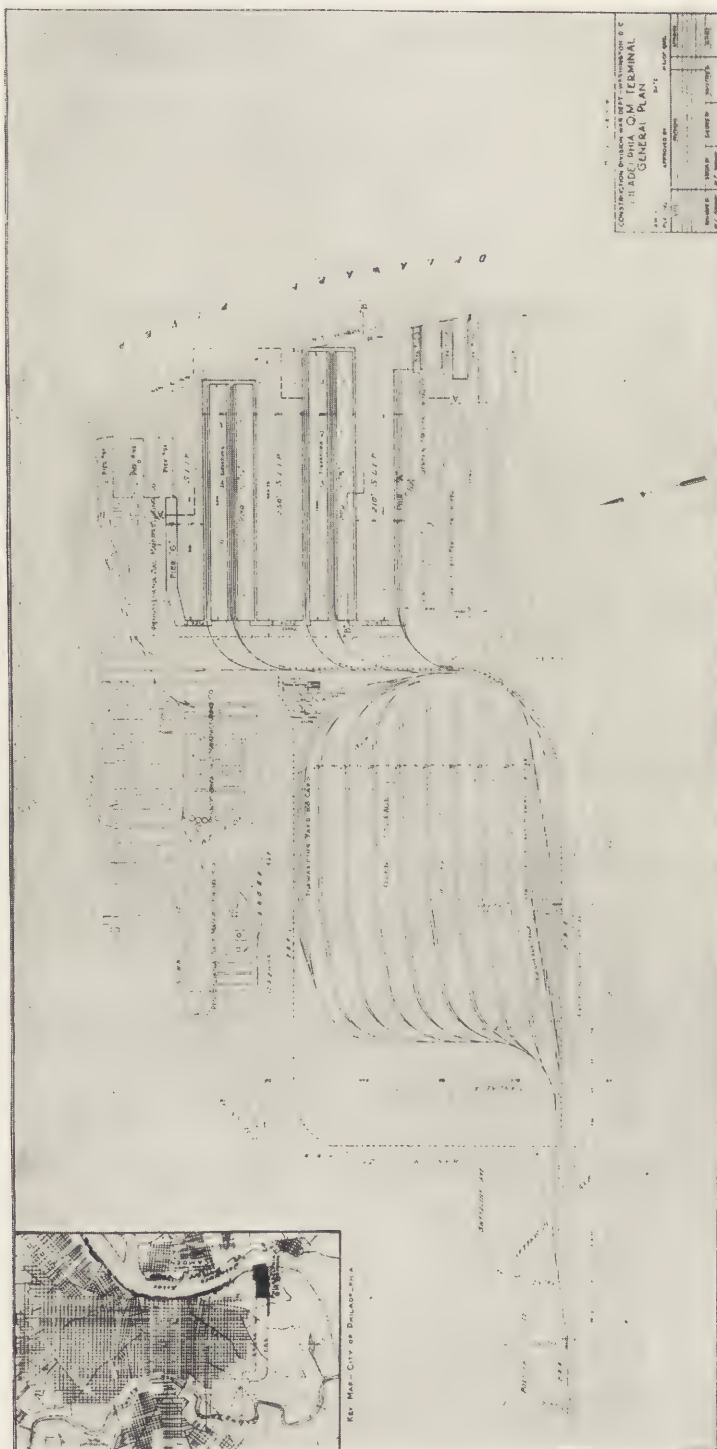
By reference to the plans of these port terminals it will be found that adequate provisions have been made for the three most essential features:

I. Ample freight yards for the storage and handling of a good supply of freight cars, which in the case of the Brooklyn Base has trackage for as many as one thousand one hundred cars. There is sufficient room at each terminal for incoming cars to be classified and conveniently grouped for loading goods into the particular ship or warehouse which is to receive them. If incoming freight arrives before the boat is ready there is a place on these tracks to store the cars temporarily, or if it is desirable to accumulate cars ahead of the arrival of ship cargoes, the tracks serve that purpose also.

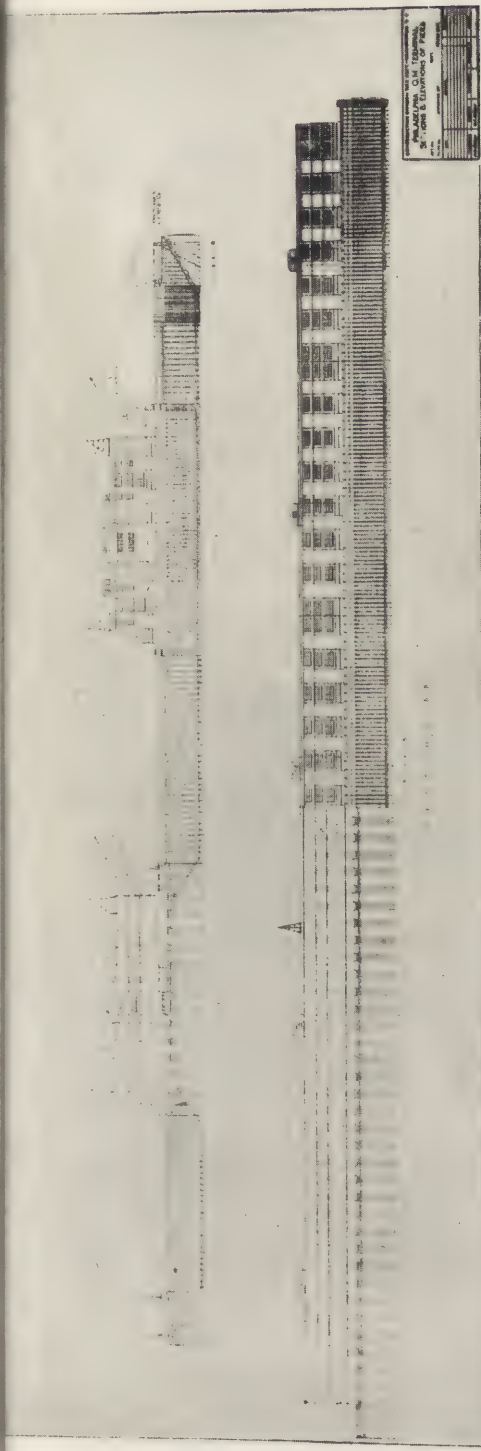
II. Large warehouse storage space has been provided in every instance. Goods going or coming can be stored away at these terminals either in fireproof or semi-fireproof buildings, where they will be well protected from fire and insured at a low rate.

III. All of the terminals are arranged so that goods may be loaded from the cars into the ships or warehouses, or, of course, the reverse. The warehouses are also arranged and equipped so that they have in all cases adequate facilities for loading cargoes into the ships.

The necessity for car "spotting" has been almost entirely eliminated by grouping car tracks largely in pairs, where they are accessible from two sides and where capacity in space for placing cars for loading or unloading has been pro-



PHILADELPHIA QUARTERMASTER TERMINAL, PHILADELPHIA, PA.
 Lieut. Col. E. B. Morden, Constructing Quartermaster.
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.
 Day & Zimmerman, Consulting Engineers, Philadelphia, Pa.
 Snare & Triest Co., Contractors, Philadelphia, Pa.



PHILADELPHIA QUARTERMASTER TERMINAL, PHILADELPHIA, PA.

Lieut. Col. E. B. Morden, Constructing Quartermaster.
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.
 Day & Zimmerman, Consulting Engineers, Philadelphia, Pa.
 Snare & Triest Co., Contractors, Philadelphia, Pa.



NEW ORLEANS ARMY SUPPLY DEPOT, NEW ORLEANS, LA.

Maj. A. P. Hoover, Constructing Quartermaster.
 Clinton H. Fisk, Supervising Constructing Quartermaster.
 Ford, Bacon & Davis, Engineers.
 George A. Fuller Company, Contractors.



NEW ORLEANS ARMY SUPPLY DEPOT, NEW ORLEANS, LA.

Maj. A. P. Hoover, Constructing Quartermaster.

Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.

Ford, Bacon & Davis, Engineers.

George A. Fuller Company, Contractors.

vided by platforms of great length. In this connection a very general provision also has been made for the use of cranes and hoists as a substitute for manual handling, and the adoption of motor tractors with trailers for platform and indoor use.

The most impressive feature of these terminals is their enormous size and capacity. What a fortunate thing it is for this country that now, when it is going to have a splendid merchant marine, these great war docks have been built in such a manner as to make them perfectly adapted for use in handling commerce with foreign nations. Terminal facilities play an important part in foreign trade, and if we were dependent upon the former inadequate facilities, there would be much difficulty in building up a foreign trade. These new port terminals ought to reduce the cost of handling, save considerable time in shipment and afford a very low insurance rate on any goods stored at these points. All of these economies will be material aids in reducing our selling prices to foreign customers.

The capacity of these great projects is so vast that it seems on inspecting them that there should be room enough for handling all of the resources of this country that we would ever care to part with. Their huge extent makes it difficult to reduce any illustrations of them down to a reasonable size for printing.

There are seven of these great port terminals along the Eastern Coast. A few of them have not been completed but the work on these will be finished in a few months. The total storage space which then will be made available will equal 17,613,800 square feet, or 404 acres in all, divided as follows: at Brooklyn 5,042,000 square feet, Norfolk 2,636,000, Boston 1,970,000, New Orleans 2,138,800, Port Newark 2,020,000, Charleston 1,800,000, and at Philadelphia 1,707,000 square feet.

In addition to this vast storage space there will be berths for sixty-five great ocean liners which can be loaded or unloaded at one time.

A brief general description of these port terminals is as follows:

BROOKLYN ARMY SUPPLY BASE, Brooklyn, N. Y.

Lt. Col. H. S. Crocker, Mem. A. S. C. E.,
Constructing Quartermaster.

Major Clinton H. Fisk, Ass. Mem.
A. S. C. E., Supervising Constructing
Quartermaster.

Cass Gilbert, F. A. I. A., Designing
Architect.

Turner Construction Company, Contractors,
New York.

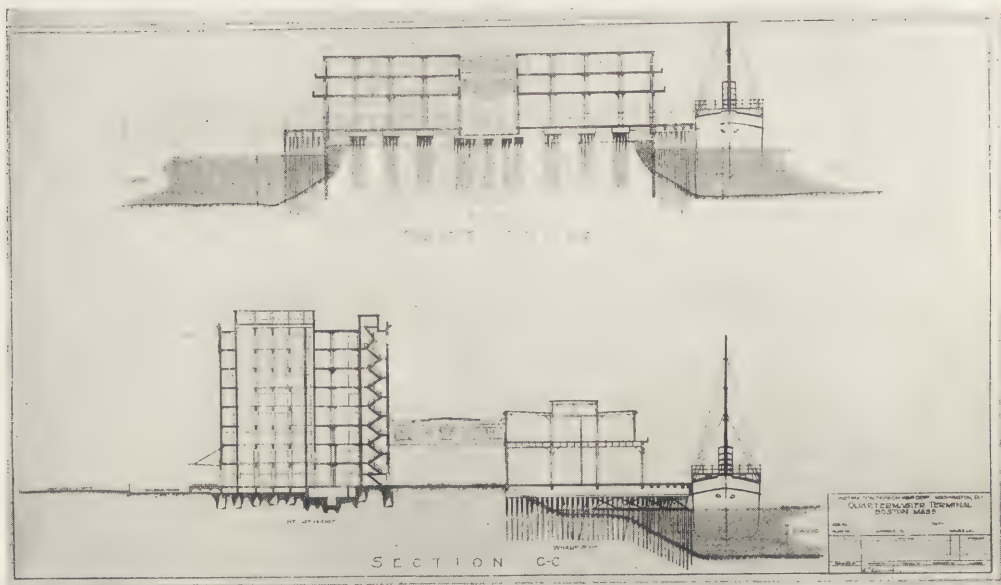
The site utilized is 2,598 feet long in one dimension and over 2,000 feet in the other. The main service railroad tracks enter the site at the lower right hand corner as shown by the plan, and the large railroad storage and switch yards branch off in two directions adjacent to each other.

The piers for ships are placed perpendicular to the two warehouses, connect with them by means of bridges, and are provided with railroad facilities.

The complete Brooklyn Army Supply Base project represents an expenditure of approximately \$32,500,000. The purpose of this project was and is to provide storage, loading and unloading facilities for over-sea shipment for the American Expeditionary Forces and also to provide a permanent port terminal. Port terminals in war times must provide for handling supplies, and possess facilities for their immediate transfer from cars to ships and the reverse, also must receive supplies for storage pending shipments which may be delayed from various causes for an extensive period.

In the main, the construction consists of two warehouses, three two-story piers and one open pier. The warehouses are eight stories and basement high, of reinforced concrete in flat slab construction. In size the warehouses which are marked Buildings "A" and "B" on the plan are respectively 200 x 960 feet and 306 x 980 feet long, totaling 3,932,000 square feet of floor area. These buildings generally have spread footing foundations and are designed for a live load of 300 pounds on first, second and third floors and 250 pounds on all other floors.

The three covered piers marked Nos. 2, 3 and 4 have a total floor area includ-



BOSTON ARMY SUPPLY BASE, BOSTON, MASS.

Maj. C. R. Gow, Mem. A.S.C.E.,
Constructing Quartermaster.
Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E.,
Supervising Constructing Quartermaster.

Fay, Spofford & Thorndike,
Consulting Engineers.
W. F. Kearns Company, Boston, Mass.,
Contractors.

ing the two stories of each of 1,110,000 square feet. These piers are 150 feet wide by 1,270 feet long. The open one-story pier marked No. 1, is 150 x 1,270 feet long.

The slips between piers are 250 feet wide and the depth of water in them at low tide is 35 feet, with the exception of the slip between piers 3 and 4, where the depth is 38 feet at low tide. Both sides of piers are equipped with cargo hoists to facilitate loading and unloading. The total berthing space of the pier is 9,000 lineal feet, which allows fifteen ships to berth simultaneously. In addition to the main warehouses and piers, there is an administration building, 206 x 70 feet, three stories, of reinforced concrete, and a boiler house, 92 x 137 feet, containing a battery of six 200 H. P. boilers equipped with automatic stokers, for heating and furnishing power for the entire project. A repair shop with adequate facilities to make all necessary repairs on ships berthing at this port is included in the plan. About 22½ miles of railroad track serve this terminal and the yards have a capacity of approximately 1,100 cars.

It will be noted in the two interior photographic views of the incompleting building that there is a large court inside of building "B", through which two railroad tracks are to pass. At the top of this court under the skylight there are to be located various traveling cranes to raise freight from the platforms below to the projecting balconies—which look like huge opera boxes—on each side of the court. From these balconies freight will be moved directly into the floor of the building where it is to be stored. This operation is also, of course, to be reversed when goods are going out of the building.

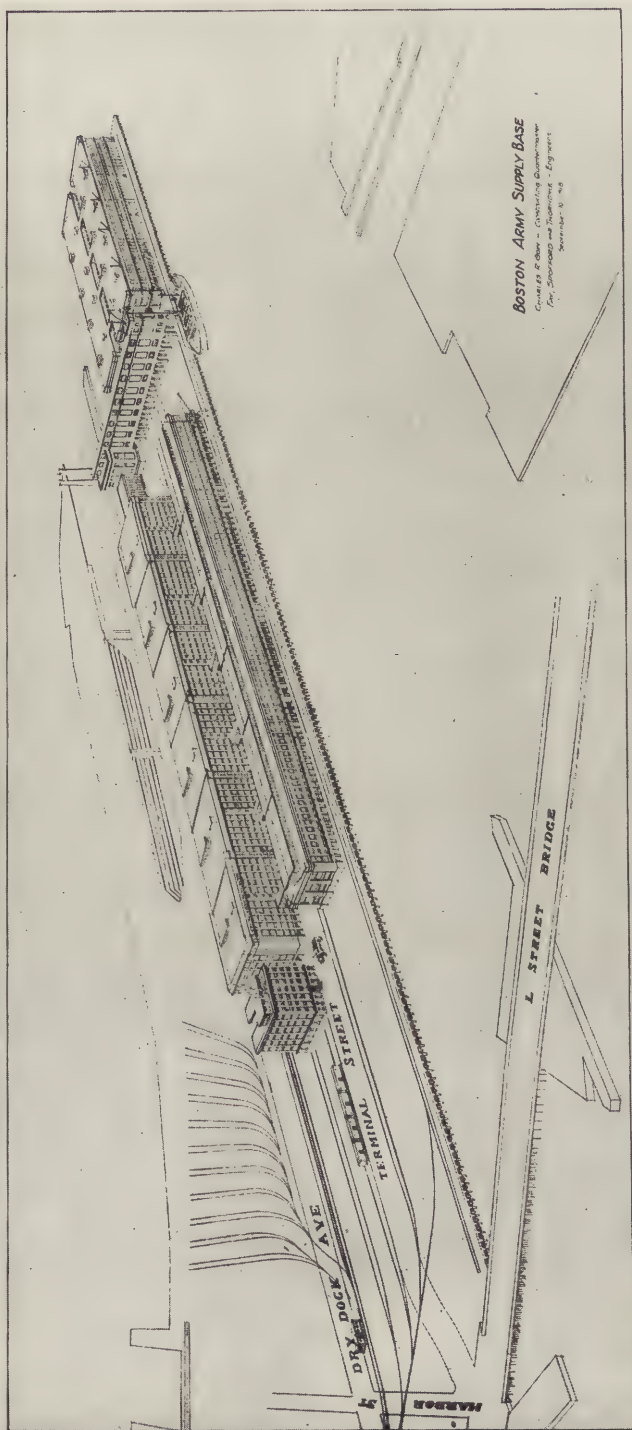
In addition to this means of handling goods vertically, there will also be seventy-eight elevators in the warehouses and eighteen on the piers.

BOSTON ARMY SUPPLY BASE.

Boston, Mass.

Major C. R. Gow, Mem. A. S. C. E.,
Constructing Quartermaster.

Major Clinton H. Fisk, Ass. Mem., A. S. C. E., Supervising Constructing Quartermaster.



ARMY STORAGE AND LOADING

NAVY STOREHOUSE

BOSTON ARMY SUPPLY BASE, BOSTON, MASS.
 Maj. C. R. Gow, Mem. A.S.C.E., Constructing Quartermaster.
 Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.
 Fay, Spofford & Thorndike, Consulting Engineers.
 W. F. Kearns Company, Boston, Mass., Contractors.

Fay, Spofford & Thordike, Consulting Engineers.

W. F. Kearns Company, Contractors, Boston.

The Boston Terminal is laid out on an entirely different principle from the Brooklyn Base, on account of the different shape of the site and the entirely different conditions which prevailed there.

The pier shed is placed parallel with the main storage building, the navy pier sheds at the end of the property on the right and the administration building at the left of the main storage building. This project was built to include provisions for the Navy as well as the Army. There is a huge dry dock which is being constructed and is located, in the perspective, just over the top of the main storage building. The trackage and switch yards are at the left of the building. The entire project of the Army Base will cost approximately \$28,000,000 and covers thirty-seven acres of land and twenty acres of water.

The main building is an eight-story reinforced concrete warehouse of beamless ceiling or flat slab construction with the first floor designed for five hundred pounds per square foot and the upper floors for three hundred pounds per square foot, covering a ground area 126 x 1,638 feet. The exterior is finished concrete. The first concrete was poured May 14th, 1918, and the last October 3rd, 1918. The brick masons followed the concrete workers (and each succeeding trade followed the preceding one) so closely that upon pouring the last concrete the building was virtually finished. There are 4,000 lineal feet of wharfage and 1,970,000 square feet of storage space in the eight-story building and the adjacent pier sheds. A railroad supporting yard has been built providing 11¼ miles of single track with capacity for 722 cars, and a terminal yard of 6½ miles of track giving a total permanent track mileage of approximately 18 miles. In addition to temporary and other small supplemental buildings, the project includes:

Main building, 126 x 1,638 feet, 8 stories.

Power house and coal crusher, 80 x 85 x 78 feet high.

Main building wharf shed, 2 stories, 100 x 1,638 feet.

Navy pier sheds, 2 three-story buildings, each 100 x 924 feet.

1 story and basement electric sub-station, 86 x 52 feet.

3 stories and basement administration building, 122 x 88 feet, designed for three additional stories.

West open wharf, 120 x 1,100 feet.

East open wharf, 72 x 580 feet.

Incomplete figures indicate that not less than the following principal items were used in the construction of the project:

Dredging, 2,500,000 cubic yards.

Reinforcing steel, 13,000 tons.

Structural steel erected, 4,300 tons.

Bricks, 5,550,000.

Sewer and water pipe laid, 7 miles.

Wood piles, 30,000.

Raymond concrete piles, 6,650.

Freight cars received and unloaded, 7,200 cars of materials.

Concrete, 240,000 cubic yards.

Square feet of forms built and erected, 5,750,000.

Temporary and permanent track, 30 miles.

Square feet of windows set and glazed, 265,000.

PHILADELPHIA QUARTERMASTER TERMINAL.

Philadelphia, Pa.

Lieut. Col. E. B. Morden, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

Day and Zimmerman, Phila., Pa., Consulting Engineers.

Snare and Triest, Phila., Pa., Contractors.

This project is located on the Delaware River and consists of one open pier, and two piers each with three-story pier sheds, with a total enclosed storage area of 1,707,000 square feet. The foundations consist of concrete pedestals supported on wooden piles and the superstructure is of reinforced concrete, flat slab design. Necessary administration area, heating plant, repair shop, etc., are in-

cluded. There are 7,400 lineal feet of berthing space for ships and necessary supporting railroad yards, with connections over the Pennsylvania Railroad.

The construction of this terminal is entirely unique compared with all of the other terminals, as it has its storage facilities provided for upon the piers. In other words the two pier sheds are really storage buildings with complete loading and unloading facilities arranged to operate directly with the ships as well as the railroads. The railroad yards are located at the left of the building in the plan and open spaces are provided between each pair of tracks for the use of storage and accessibility of trucks and wagons. The doing away with the "spotting" of cars is well provided for in this freight yard.

The buildings are particularly interesting as their roofs have been utilized for the handling of freight. By reference to the sectional drawing, it will be seen that the second and third stories of these buildings have been set back on one side so as to make shelves at these levels to serve as platforms in handling of goods directly into the story where they are to go or from these platforms into the ships.

On the top of each building it will be seen that there are hoists and cranes which operate in connection with those on the ships to load goods from any level of the sheds directly into the ships or vice versa. The building hoists are movable so that they may be adapted to the location of the hatches in the ships as they come along the dock. The floor loads of the dock level are 500 pounds per square foot and those of the second and third floors 300 pounds per square foot.

PORT NEWARK QUARTERMASTER TERMINAL.

Newark, N. J.

Col. F. E. Lamphere, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

Clarence Healy, Consulting Engineer.

Mason & Hanger, and McArthur Bros., Contractors.

Port Newark Terminal consists of 9

warehouses, containing about 1,652,000 square feet and 2 open sheds of about 368,000 square feet area, built at right angles to a dock about 3,800 feet in length. The location of this work is on a piece of hydraulic fill made on the Jersey meadows, three miles from the city of Newark. The warehouses are entirely upon pile foundations, 60,000 piles being used in this work and in the dock. The warehouses are all one-story with plank floors, six-inch terra cotta walls and mill construction roofs, except one which has brick walls. This one was carried to two stories over a part of its length to afford space for office use. Barracks were provided for approximately 1,800 men, together with mess halls, officers' quarters, fire station, garage and other necessary supplementary buildings. Although the work was done in the face of weather conditions of unprecedented severity in the latter part of 1917 and the early part of 1918, most of the project was completed within three months. To complete the work on schedule in the face of these difficulties, over 10,000 men were at one time employed. Sixty-seven pile drivers were simultaneously used and other equipment in proportion. Some of the principal items involved were:

- Lumber, 28,000,000 board feet.
- Brick, 3,500,000 bricks.
- Terra Cotta, 400,000 square feet.
- Dredging, 800,000 cubic yards.
- Railroad track, approximately 12 miles.

CHARLESTON QUARTERMASTER TERMINAL.

Charleston, S. C.

Col. F. E. Lamphere, Constructing Quartermaster.

W. E. Gove, Prin. Ass't Engineer.

Mason & Hanger Contracting Company, Contractors.

This project is located on Cooper River about eight miles west of Charleston, S. C., and consists of six warehouses with tile walls, concrete floors, and mill construction roofs, totaling 1,152,000 square feet with connecting dock shed with tile walls, mill construction floor and roof, containing 269,000 square feet. Two open sheds with mill construction

roof and cinder floor, totaling 379,000 square feet. Necessary administration building, heating plant, repair shops, etc., are included. There are 3,586 lineal feet of berthing space for ships, necessary supporting railroad connections with the Atlantic Coast Line, Southern Railroad and the Seaboard Air Line.

NORFOLK, VIRGINIA, QUARTERMASTER TERMINAL.

Col. M. A. Butler, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

A. O. Leach, Supervising Engineer.

Porter Bros., Contractors.

This project is located at Bush Bluff, about 4 miles from Norfolk, Va., and consists of eight one-story warehouses with tile walls; concrete floors, and mill construction roofs with a total of 2,016,000 square feet, and 2 piers with pier sheds of steel and guncrete construction totaling 620,800 square feet. Necessary administration building, heating plant, repair shops, etc., are included. There are 5,400 lineal feet of berthing space for ships, and necessary supporting railroad yards. Railway connections are via Virginia Railway over which the belt line has operating rights. There is also connection by car floats with the C. & O., and the F. & N. Railways.

NEW ORLEANS ARMY SUPPLY BASE.

Major A. P. Hoover, Supervising Constructing Quartermaster.

Major C. H. Fisk, Supervising Constructing Quartermaster.

George A. Fuller Co., Contractors, New York.

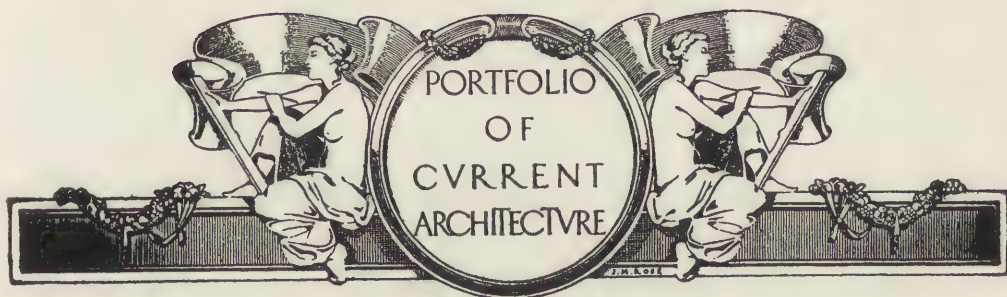
Ford, Bacon and Davis, Engineers, New Orleans, La.

The New Orleans Army Supply Base is located on the Mississippi river in the city of New Orleans and consists of three 6 story reinforced concrete warehouses of about 500,000 square feet each. Two thousand feet of dock with two story dock shed, and containing approximately 346,000 square feet. On account of soil conditions the three warehouses are set back from the river and connect with the dock by means of bridges that connect the third and fourth floors of the warehouses with the second floor level of the dock shed.

The warehouses are of flat slab design and carry floor loads of 400 pounds first floor, 350 pounds second floor, and 250 pounds above. The dock shed is of structural steel above pile and timber substructure, covered with corrugated iron and designed for a deck load of 400 pounds per square foot, and for 250 pounds on the second floor. Foundations for the warehouses are of untreated piles and for the dock and dock shed the pile and timber substructure are creosoted.

Ample elevator service is provided for the warehouse and dock shed and intercommunication between the various units is by means of electric tractors with trailers. The warehouses and dock shed are equipped with sprinkler system, electric wiring for light and power and battery charging facilities for the tractors.

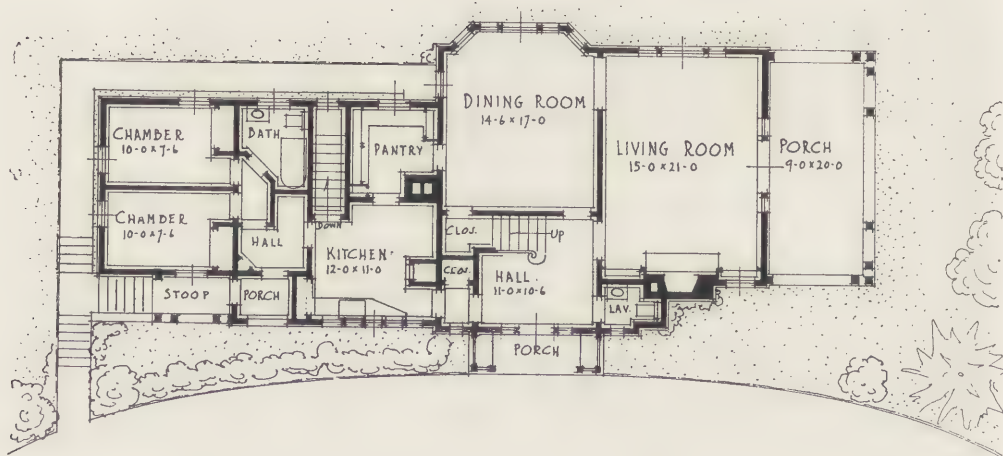
Necessary supporting railroad yards are provided and all equipment necessary to meet the requirements of the Army.



RESIDENCE OF CHARLES THORNTON LADD, ESQ.,
RIVERA, OREGON. LAWRENCE & HOLFORD, ARCHITECTS.



SECOND FLOOR PLAN

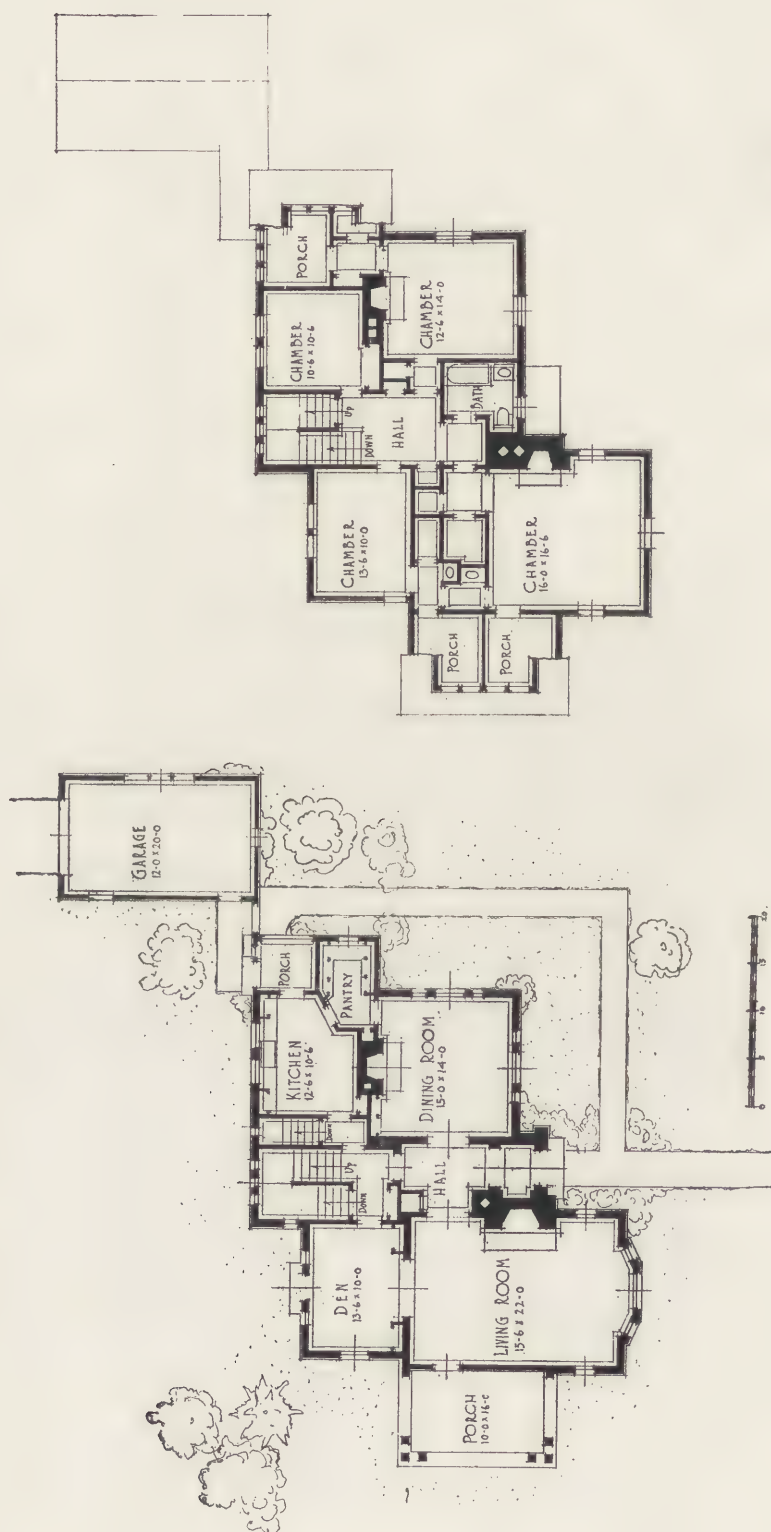


FIRST FLOOR PLAN

FIRST AND SECOND FLOOR PLANS—RESIDENCE
OF CHARLES THORNTON LADD, ESQ., RIVERA,
OREGON. LAWRENCE & HOLFORD, ARCHITECTS.



RESIDENCE OF D. W. GREEN, ESQ., PORTLAND,
OREGON. LAWRENCE & HOLFORD, ARCHITECTS.



FIRST AND SECOND FLOOR PLANS—RESIDENCE
OF D. W. GREEN, ESQ., PORTLAND, OREGON.
LAWRENCE & HOLFORD, ARCHITECTS.



A Government Employment Bureau.

Engineers, executives, men of college training and practical experience in business and technical fields are now being released from the army, navy and war work. The Professional and Special Section of the U. S. Employment Service, a branch of the Department of Labor, has been organized for the benefit of employers in need of these men. The service is entirely free of charge.

The organization already has thousands of well educated, experienced men on its lists and is daily placing many of them in touch with employers. Mr. I. W. Litchfield, the head of the Professional and Special Section, was one of the organizers and directors of the U. S. Public Service Reserve, which supplied high-grade engineers and business men to the Government for war work.

The U. S. Employment Service is now divided into two great zones for the purposes of the Professional and Special Section. The New York office, headquarters for the eastern zone, at 16 East 42d street, is in charge of the following states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Ohio, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida and Alabama.

The Chicago office, headquarters for the central zone, at 63 East Adams street, is in charge of all remaining states. Later zone offices will be established to take charge of part of the territory now in the Chicago zone. The U. S. Employment Service is now represented in each of the forty-eight states by a head office under the immediate jurisdiction of the Federal Director for that state.

The zone offices at New York and Chicago have become clearing houses for their respective parts of the nation, where returning men are classified in accordance with their qualifications, and where the requisitions of employers are matched against them. So complete is the system of classification and so diverse the qualifications of the thousands of applicants that the most exacting requirements of an employer, as stated in his requisition, can be met in each detail. When the qualifications of a man and the specifications for a position are accurately matched the man and employer are immediately placed in touch with each other by the Professional and Special Section.

The United Engineering Societies, composed of the four great engineering organizations—the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers and the American Institute of Mining Engineers—are now co-operating with the Professional and Special Section in placing men in the engineering professions. The high standards maintained both by the Government organization and by the societies has proved to be of the utmost benefit to employers, as well as to experienced engineers seeking employment.

The interests of women fit for high-grade business, technical and professional positions are cared for by another branch, which is administered by experienced professional women. In order to register in the women's branch an applicant must be either a college graduate or experienced in some particular line of executive or administrative work.

The employer should at once get in touch with the office of the Federal Director in his state or write direct to either the New York or Chicago zone offices. It is important that the employer give complete and

specific details of the position to be filled, together with the maximum and minimum salary he is willing to pay. These details are regarded as confidential by the Government and are withheld from the applicant.

Once introduced to each other the employer and applicant are left to work out details. Often a number of applicants with equally good qualifications are referred to the same employer in order that he may decide for himself on a basis of their personalities.

A Projected War Memorial.

In a recent meeting of the New York Chapter of the American Institute of Architects the following resolution was passed with reference to a sug-

gested memorial to commemorate the valor of American soldiers and sailors in the world war:

"WHEREAS, The Fine Arts Federation is about to appoint a committee to consider the form to be taken by a permanent memorial to commemorate the valor of the American soldiers and sailors in the world war; and

"WHEREAS, The realization of such a memorial, of whatever nature, is of vital importance to the community in that it should be a true expression of the sentiment of the citizens of New York as to form a memorial deemed most appropriate:

"BE IT RESOLVED, That the New York Chapter of the American Institute of Architects present to the Fine Arts Federation, for its earnest consideration, the following program and plan of procedure:

"That a committee be appointed to institute a preliminary competition of ideas or suggestions, to be open to all citizens residing or maintaining an established place of business in Greater New York.

"That their ideas or suggestions be presented in one of the following mediums:

"A—In letter form.

"B—In sketch form—a perspective and plan.

"C—In plastic form—a model and plan.

"A location or plot plan to be submitted if the idea be in the form of a structure.

"As an essential part of this preliminary competition a first prize, with possibly secondary prizes, should be awarded.

"That the judgment of this competition of ideas be rendered, after public exhibi-

tion, by a jury composed of representative citizens. It is suggested that the jury of award be composed of fifteen members, three members appointed by each of such organizations as the New York Chamber of Commerce, the Merchants' Association, the Fine Arts Federation, the Society of Arts and Letters, etc.

"That the idea awarded the first prize in this preliminary competition be made the subject of a final competition.

"That the winner of this final competition be awarded the commission to execute the memorial.

"In conclusion the New York Chapter feels that in this manner can best be obtained the opinion and the sentiment of the citizens of New York as to the form of the memorial."

A Dearth of Architects.

There are sound reasons for the fact that the architect as a rule chooses the large city for his headquarters. The big undertakings come to the big cities, but it seems as though

the natural tendency of the profession to gravitate toward such centers sometimes works an injustice upon the smaller towns. Mr. O. R. Hardwell, secretary of the Chamber of Commerce of Freeport, Ill., expresses himself upon the point as follows:

"Have you ever preached to your readers, particularly of the younger generation, about the opportunity for the live and ambitious architect in the American Middle-West?

"I think it was Horace Greeley who said, 'Young man, go West.' Greeley was right. Architects are rare birds in these parts. Take Freeport as an example. Here we are, right in the heart of the richest farming country in America, tapped by nine railway lines, three hours' ride from Chicago, and not a single architect in our city of 22,000 population. Can you beat it?

"This peculiar situation is common to many towns of our size in the Mississippi Valley. Moreover, it strikes home with a cold thud, when we begin guessing about our prospective work in this period of rebuilding and reconstruction—who is going to make our plans?

"Your publication can do some good missionary work and your readers can profit by the suggestion."

THE ARCHITECTURAL RECORD

APRIL

1919



PUBLISHED IN NEW YORK
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Bishopric Board means low cost for up-keep

Here is a row of ten double houses erected by The Haddon-Browning Realty Co. in West Collingswood, N. J.

They all have stucco exteriors and the background for the stucco is Bishopric Board. The Haddon-Browning Co. designed these buildings to last and therefore used that most lasting background for stucco—Bishopric Board.

Note how Bishopric Board is constructed, as shown in illustration below. It does not require an expert to see why Bishopric Board is the most lasting background on the market for stucco finish.

Bishopric Board is made of creosoted heavy wood strips, imbedded in Asphalt Mastic, on a background of heavy fibre-board.

When applied, the stucco is dovetailed into the lath, forming one solid piece. The dovetailed joint holds the stucco so that it can't let go.

The fibre-board, Asphalt Mastic and creosoted lath give absolute protection against heat and cold, wind and weather. They form a combination that is water, vermin and sound proof.

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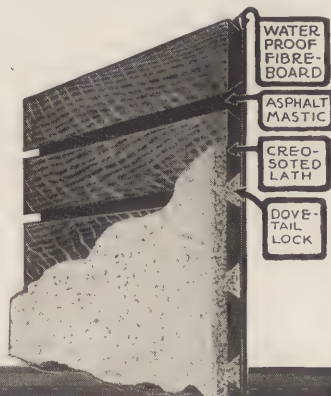
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THE ARCHITECTURAL RECORD



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Contributing Editor: HERBERT CROLY

Business Manager: J. A. OAKLEY

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A GARDEN WALK—SUMMER HOME OF GEORGE
C. NIMMONS AT FLOSSMOOR, ILLINOIS.

The SUMMER HOME of GEORGE C. NIMMONS

— at Flossmoor, Illinois —

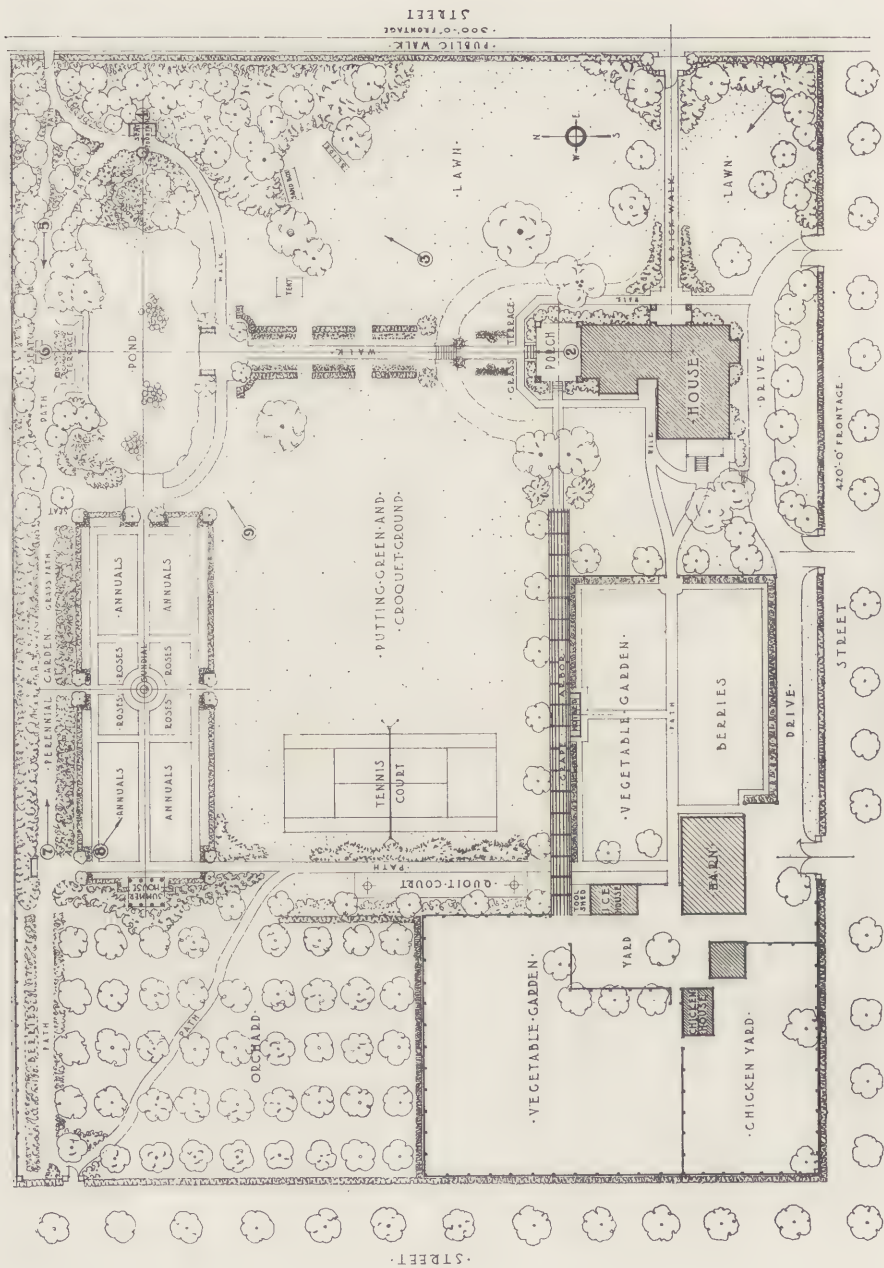
GOLF and gardening as a means for recreation and amusement have probably been the cause in recent years of the building of more summer homes in the country or suburbs than any other agency. The grounds of the golf club usually form the center of a community around which the members of a club build their homes. Often the land surrounding the golf course, upon which these homes are built, is uninteresting and devoid of trees or natural attractions; but the golf course itself in order to be suitable for golf is sure to possess sufficient diversity and landscape features to make a fine foreground for residences, with many beautiful and attractive long-distance views. In fact, a modern golf course, with its great open fair-ways, its velvet-like putting greens, its woods, sand traps, bunkers, hills and water-ways, often forms a landscape of great charm, particularly in the morning and evening, when the shadows are intensified by the smoothness and light color of the well-kept grass upon which they fall.

Being assured of such a prospect in front of their houses, the members are usually quite content to build upon the surrounding land, even though it be bare, and create anew whatever setting for their homes and landscape effects in their grounds that they may desire.

There are certain advantages to be gained in such instances to compensate for the lack of full-grown trees or other features of the more fortunate building sites, as there is nothing in this way to limit or interfere with the adoption of whatever treatment of the grounds is desired, and the trees and other features of the landscape can be placed exactly in the positions, in reference to the house

and different parts of the grounds, where they will be most effective. The greatest compensation for the lack of natural landscape features around the house at first is, of course, the golf grounds; but if quick-growing trees are transplanted, the owner does not need to wait long before the effects from such a treatment become interesting and attractive. In the meantime he has the beautiful views over the golf course to interest him while he is waiting for the effects of his own grounds to develop.

An example of a summer home overlooking a golf course built under such conditions forms the subject of this article. It was built upon a site 300 x 420 feet, with streets on three sides. The ground was originally a corn field without a tree on it and all of the growth of trees and shrubbery shown has been attained since the house was built about ten years ago. The trees selected for transplanting were only of a fair size, but of the quick-growing varieties, mostly soft maples and Carolina poplars, which, contrary to the predictions of the nurseries, have proven very satisfactory, have been free from scale or other tree diseases and have not lost their branches or been broken to any objectionable extent by the high winds which came with storms during this time. These trees were all planted in the positions which screened off the least interesting views and opened up those of most attraction from the desirable viewpoints of the house. As the house fronts the golf course of over 200 acres of beautiful landscape, the planting of the trees around the house was, therefore, contrived so as to secure views of the most attractive parts of these grounds. The



SUMMER HOME OF GEORGE C. NIMMONS.
FLOSSMOOR, ILLINOIS.
GEORGE C. NIMMONS ARCHITECT



SUMMER HOME OF GEORGE C.
NIMMONS AT FLOSSMOOR, ILLINOIS.



FROM THE END OF THE GARDEN—SUMMER HOME
OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



POOL AND FOUNTAIN IN THE GARDEN—SUMMER HOME
OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



GARDEN—THE SUMMER HOME OF GEORGE
C. NIMMONS AT FLOSSMOOR, ILLINOIS.



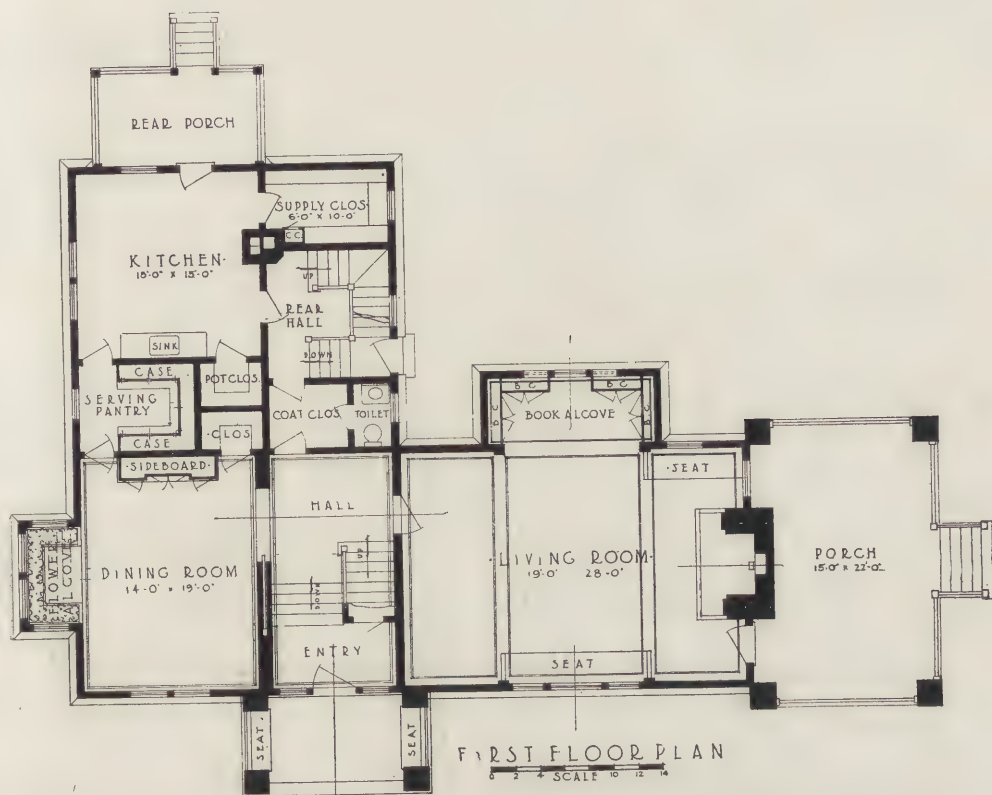
VIEW ACROSS THE LAKE—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



FLOWER GARDEN AND WALK—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



GARDEN—THE SUMMER HOME OF GEORGE
C. NIMMONS AT FLOSSMOOR, ILLINOIS.



• RESIDENCE OF GEORGE C. NIMMONS • ARCHITECT •
• AT FLOSSMOOR • ILLS •

PLAN OF FIRST FLOOR—SUMMER HOME OF
GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



• RESIDENCE OF GEORGE C. NIMMONS • ARCHITECT •
• AT FLOSSMOOR • ILLS •

PLAN OF SECOND FLOOR—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.

locating of the other trees and planting of the grounds were determined by the design of the landscape features of the place illustrated by the plan.

The features of the grounds which were given the most importance in designing the landscape effects were the paths and walks, the lily pond—which is about 40 x 100 feet in size, with its fountain and cascade—flower gardens, vegetable gardens, a berry garden, an old-fashioned round-topped grape arbor and a playground, with space for a putting green, croquet and tennis court.

An unusual length of paths and walks for a place of this size was secured by the design of the grounds shown on the plan, as their total length is about 1,500 lineal feet. The main walk from the principal veranda on the north side of the house extends directly to the pond, where

two paths branch off that lead to the flower gardens and the fountain located in the clearing in the dense planting in the corner of the grounds. The path to the right leads up a little hill, on the top of which is the fountain and a stone seat under a tree, which gives a view down the cascade flowing into the pond, and on over the pond into the annual flower garden terminated by the summer house shown in this view. The clearing at the fountain opens into a grass path that runs back of the pond, where the house is mirrored as shown in one of the illustrations, and then the path leads on through the perennial flower garden into the orchard. There are branches from this path along the way that open into the annual garden, surrounded by a mulberry hedge, near which are wild cherry trees that attract the birds. From the orchard the path re-



ENCLOSED BEDROOM PORCH—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



THE DINING ROOM—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.

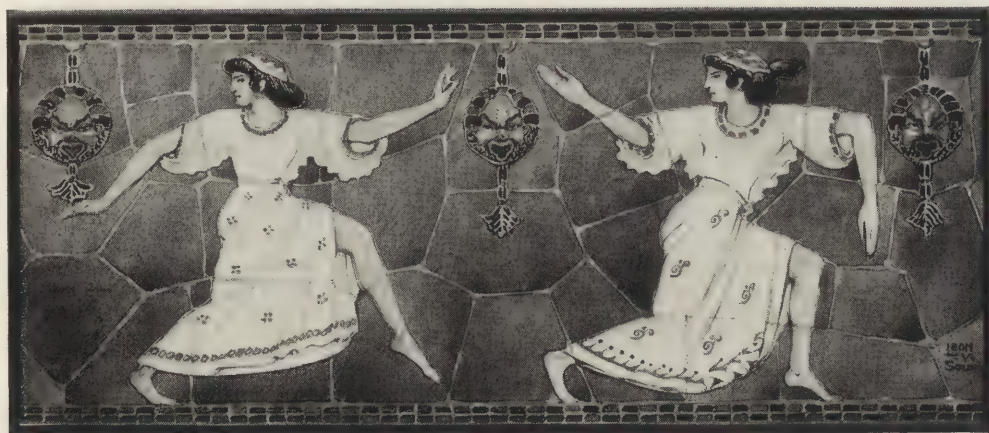
turns toward the barn, the vegetable gardens and the round-topped grape arbor, that forms a refreshing green tunnel through which to return to the veranda from where one started.

The plans of the house show an entrance hall in the first story between the living room and dining room, placed low enough to allow for a mezzanine porch off the landing of the stairs, which affords at this point a very commanding view of the golf grounds. As the house was only to be occupied in summer, the principal veranda was placed on the north side of the house instead of on the south,

as is usually the case, so as to secure the shade that is nearly always desirable in this season of the year. The owner's bedroom suite is over the living room below and has its closets and bathroom arranged on each side of a private hall leading up to the bedroom. Beyond this is an inclosed porch with very good views over the grounds. The other bedroom in this story fronts south; and the servants' quarters are in the third story. In the basement is a very complete carpenter's shop, which has been used by the owner in making some of the furniture for the house.



THE PLAYGROUND—SUMMER HOME OF GEORGE C. NIMMONS AT FLOSSMOOR, ILLINOIS.



FAIENCE FRIEZE, BY LEON V. SOLON.

A POTTER AND HIS WORK — LEON V. SOLON —



BY H. VAN BUREN MACONICLE.

TO measure the comparative forces of heredity and training is a fascinating study; an awful fascination lies in its danger; human nature has such a way of breaking the web of the finest spun theories. But sometimes by a happy concurrence both training and heredity join forces to produce an artist like Solon, a potter, a maker of lovely pattern, equally skilful in the evocation of delicate fantasies or of virile works in clay.

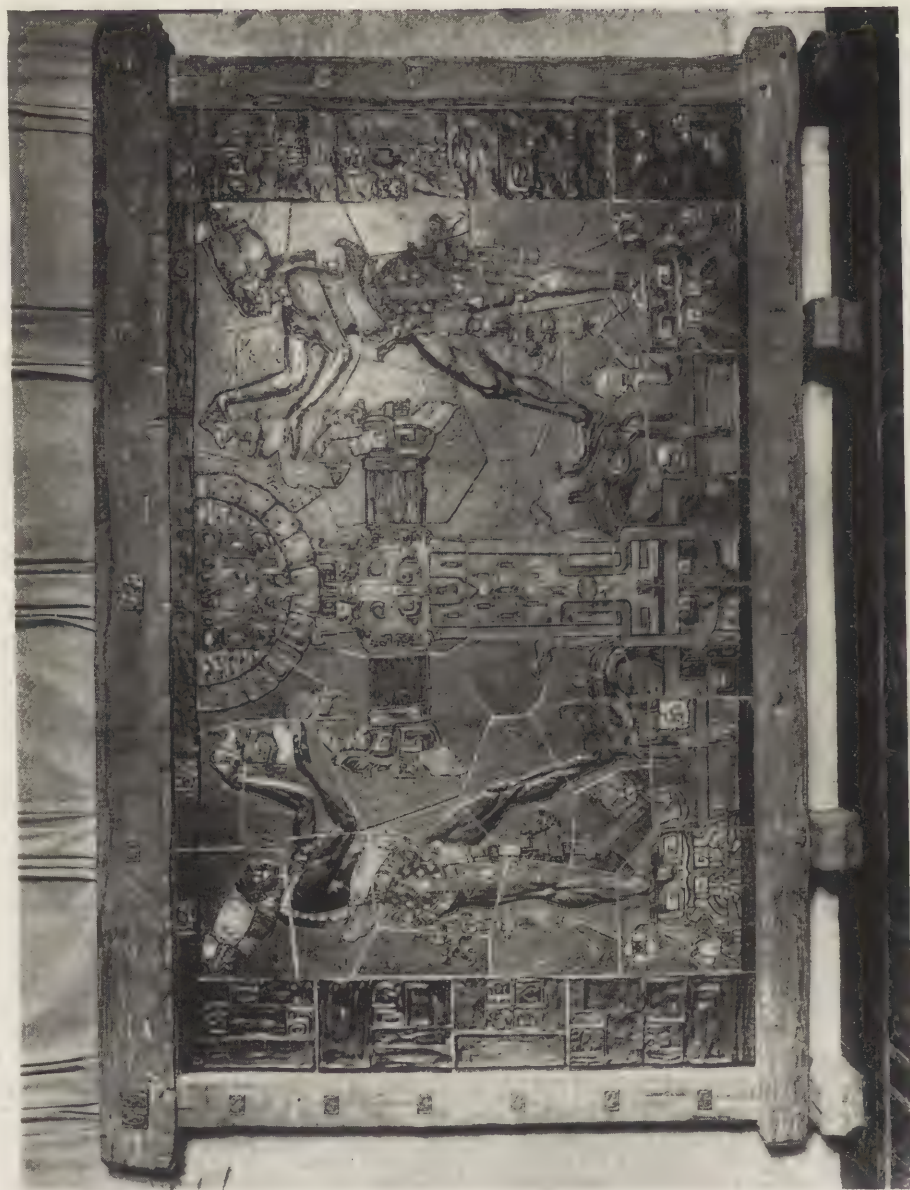
It has become almost the exception in this country for a boy to follow his father's calling; it is much more usual abroad, although a background of three hundred years of family tradition and achievement in a craft, such as Solon's, is not common anywhere. His father was Louis Marc Solon, one of the most celebrated of modern potters. As a student at the Ecole des Beaux Arts he was one of that brilliant group of which Fantin La

Tour, P. V. Galland, Legros, Regnaud, Bracquemond and Jacquemart were members, and who always maintained the old cordial relations of their student days. The very mention of the names evokes the Paris of the third Napoleon—not quite the one Du Maurier so loved, but a most beguiling Paris nevertheless. Solon grandpère was Chief Justice of Egypt under Napoleon III, and was later recalled and the revision of the Code Napoleon placed in his hands.

Louis Marc on leaving the Ecole des Beaux Arts became a designer in the Sevres factory, where he originated the *pâte-sur-pâte* ware. In 1870 he and Galland went to England together, where Solon established a connection with the great Minturn works and made *pâte-sur-pâte* famous. Minturn's is at Stoke-on-Trent, one of the "five towns" which made Arnold Bennett's reputation: Burslem, Tunstall, Hanley, Stoke-on-Trent,



SKETCH BY LEON V. SOLON.



FAIENCE PANEL, "THE SUN-
GOD," BY LEON V. SOLON.



ORTHOCHROMATIC REPRODUCTION OF WATER COLOR STUDY BY LEON V. SOLON.

Longton; there, day and night, the smoke of the kilns of the greatest pottery centre of the world goes up to heaven—and it was in this atmosphere Leon V. first drew breath. The managing director of Minturn's was Leon Arnoux, one of a long line of French potters; for three hundred years his family has made the Moustiers, Moulins, Apt and Toulouse faïences, known to connoisseurs the world over. Louis Marc Solon married Miss Arnoux. After their first son had passed through the hands of private tutors he was sent to the Hanley School of Art, won one of the ten National Scholarships given yearly for the British Possessions, and in the same year became Royal Exhibitioner—another scholarship. Two scholarships at once would never do, so they took one away and the youthful prodigy went up to London to the South

Kensington Schools for three years, and with sundry medals returned to Stoke-on-Trent and the Minturns. In two years, upon the retirement of his grandfather Arnoux, he became Art Director of the company, and filled that important post for ten years. During this period he exhibited paintings in oil and water color, and decorations in faïence, at the Salon, the Royal Academy and International Exhibitions. Upon the amalgamation of the Decorative Art Departments of the University and of the City of Liverpool he was called upon to reorganize these schools on the basis of craftsmanship directly applied to design, and inaugurated there a novel and very successful method of teaching design. After two years he came to the United States, where for four years he painted portraits and mural decorations, illustrations and that



ONE OF A SERIES OF FAN DESIGNS BY LEON V. SOLON.

sort of thing, acting *ad interim* in an advisory capacity in relation to the American market to various English ceramic houses. He then became the Art Director of one of the largest companies here, where he is engaged in developing the decorative possibilities of faience.

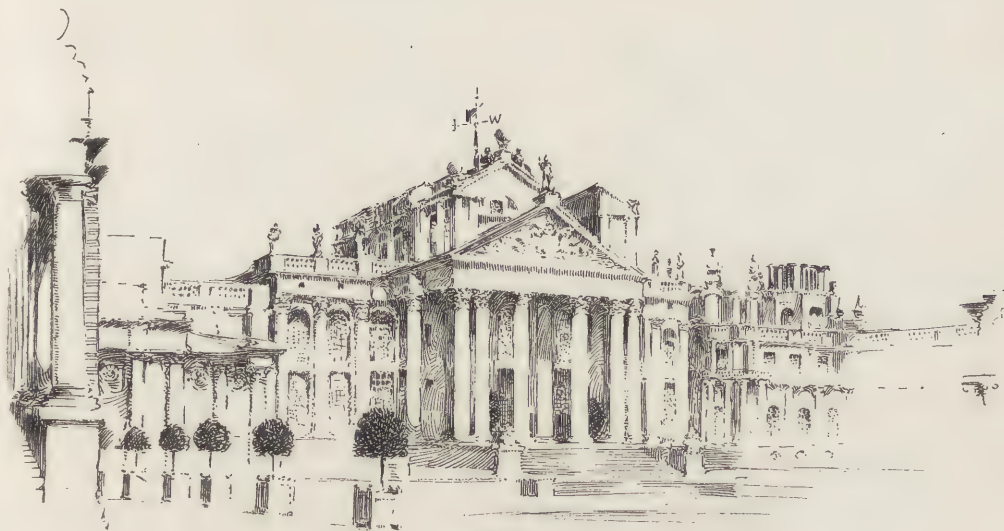
This is the bare record. It takes account of the formal training of the youth and the practice of the man—it does not reveal the early, partly unconscious, training the boy received from his father, the most valuable of all. It only hints of the myriad impressions of a childhood passed among the descendants of potters for generations. Solon père possessed the greatest library on ceramics in the world; at his death it was purchased by Andrew Carnegie and presented to the Ceramic Technical Institute of North Staffordshire, and has been but recently opened as the Solon Library. When Leon was a boy he spent evenings and Sundays without end, every spare moment, under his father's sympathetic guidance, poring over the books, particularly those on Greek vases. He drew Greek vases and the decorations on them and then drew them again and again, and his father made him draw them right. The fruit of this boyish work is manifest in almost everything that comes from the hand of the man. The influence of Greece is like the pure sweet sound of a silver bell

heard through the roar and clangor of a busy street; in art it manifests itself in a certain rhythm, a gracious balance, a disposition of light and shade unmistakable, quite indescribable; it never descends to the merely pretty—a strong masculine note runs through it. One has but to look over Solon's drawings to see how these qualities interpenetrate his work; I can find no single figure, no single motif upon which one may lay an accusing finger and say, "That is cribbed"; they do not suggest an accusation—but what is in them seems familiar and you realize that it is the spirit in them, the character of them that has affected you—that they are sympathetic interpretations of a thousand sources, not literal transcriptions of any one.

There is no leaven like it, the Greek influence; it gives restraint, the sense of power in reserve. Some phrasemaker once spoke of "the cold perfection of the Greek"—a cheerful and complacent idiot who was merely incapable of apprehending anything Greek soever; the warmth and the color were not for him, the vibrant subtleties of modulation escaped him. In restoring to us a sense of Greek color-mass as distinguished from Greek line, and yet without losing line, Solon is to be thanked. I possess a sketch of his—a portion of a faience frieze in which two



SKETCH BY LEON V. SOLON.



SKETCH BY LEON V. SOLON.

early Greek maidens figure on a rich blue ground, on which masks are hung at balanced intervals and whose vertical lines stabilize the action of the dancers—two black-haired maidens out of the joyous childhood of Greece, in whom nevertheless, if one has the key, one may trace a certain Caledonian character—Greece and Scotland united by the vision of a potter of Gallic ancestry. In this study one realizes what design in the Greek spirit may mean in the hands of one who has made that spirit his own; we catch a glimpse of the splendor of Greek color—we who are too prone to think of Greece in terms of cold white marble, and who thus yet suffer from the tradition for which the frigid inanities of Canova, Thorwaldsen and Hiram Powers are responsible—we who forget that the architecture of the Greeks was above all a polychrome architecture, their glyptic art a polychrome art. The amount of polychrome terra cotta used throughout Greece was enormous. With their cool practical sense, the Greeks, when they could not afford Pentelican marble enriched with pigment, took colored terra cotta as an acceptable substitute, and did not attempt to make it look like colored marble. Their taste saved them in this as in other things.

But if I interpret aright what Solon is

trying to do, it is not to reproduce Greek forms in faience but rather to seek out and apply the principles upon which the Greeks worked with color—how the application of color was foreseen and provided for in the modeling of the form at the very outset. Most architects when they would use polychrome and relief in conjunction hark back to the tradition of the later Robbias, a quasi-naturalistic coloration of ornamental forms, the forms themselves modeled without reference to the reception of color. In dealing with principles the designer is free to apply them to design in the general character of any period and produce something quite new. The idea of the *cloison* applied to polychrome ornament with an Italian Renaissance parentage is provocative and inspiring.

I have selected some of Solon's designs for reproduction principally to show his range—from the dainty decoration of a fan to the solid qualities of "The Sun God"—and also to show his growth. It is interesting to compare in this respect the series of cover designs for the Architectural Record now appearing, with some of the earlier things. But these are only drawings. Solon is a potter, first, last and all the time. He makes one believe in the Biblical myth of man's origin, so much does clay seem a part of

him. And it is in his work in clay that one finds the native expression of the man. His palette is both bold and delicate. He uses red glazes that are like a cry of joy, resonant blues, deep browns and luscious yellows—and black. By the use of black one knows the colorist. Solon knows how to use it. In design, his work in tile and faience shows an amazing adaptability, flexibility. He is as much at home in Chinese as in the

most modern and ingenious use of the simple shapes and sizes of ordinary tile, which fall into place under his fingers in new and interesting relations.

We may felicitate ourselves upon the transplantation to America of a talent like this, the exemplar of a training so long and sound, of the tradition of design and craftsmanship as inseparable we so deplorably lack here and which we must cultivate and foster.



DESIGN FOR GREETING CARD, BY LEON V. SOLON.



Plate A.

HEADQUARTERS BUILDING, SHOWING CAMOUFLAGE OF PAINT ON THE SIDES AND BRUSH ON THE ROOF.

AMERICAN COMBAT — AIRDROMES —



BY CHARLES C. LORING.

THE American-built airdome on the Western Front was different from the flying fields here, owing to the danger from bombing and to the character of the building material available. There were various types more or less specialized and placed at well defined distances from the trenches—such as the "Pursuit" and the "Observation," the "Day" and the "Night Bombing,"—but their main features were similar.

The plans and photographs here reproduced show the characteristic irregular grouping, distressing to the efficiency engineer but rendering the plants much less vulnerable as targets. As one officer proudly boasted, "No two hangars are on the same straight line."

The typical A. E. F. combat airdrome covered two hundred and fifty acres.

The flying fields themselves were at least five hundred yards in diameter, usually longer in one dimension and preferably rising slightly at the center so that the planes could take off down hill and against the wind, no matter from what direction it was blowing. The field had to be free from all pits or hummocks so that when a pilot landed at forty miles an hour he could call it the end of a perfect day and not a \$15,000 crash. Also if the turf was thin all pebbles had to be removed and the surface heavily rolled. This was done to keep the propellers, when they were tuning up preparatory to flight, from sucking in bits of stone which might injure the fibre and cause the laminated blades to tear themselves to pieces in the air.

The French countryside is composed



Plate B. Typical airdrome in open country and one of the first of the American built and occupied. This vertical bird's-eye view shows the exact plan, with the hangars grouped at one end of the flying field and the living quarters at the other, but it does not indicate that the field was at the top of a steep knoll, as shown in plate D. The stripes around the airdrome are the characteristic narrow farms of the French countryside. An observation plane is in the center of the flying field, and three others are near the central hangar. The longer barracks beside the road at the bottom of the plate are large enough to house one hundred enlisted men.



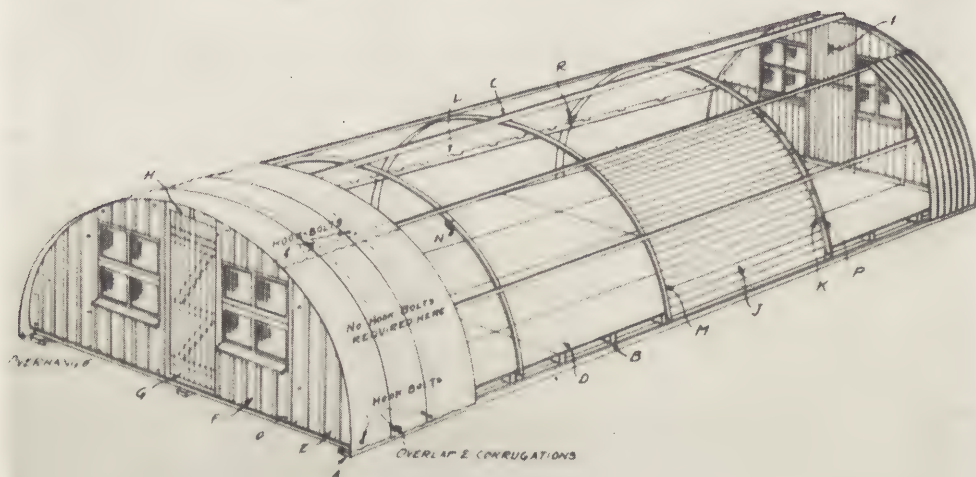
Plate C. Diagonal view of airdrome, shown in plate B. The Meuse River is flowing past the little village on the right of the picture, and the wooded hillsides in the background reach up to the St. Mihiel salient.



Plate D. View showing the Nissen huts and demountable wood barracks in the lower part of plate B. This photograph also shows the slope of the hill at the top of which the flying field was located. Note plate on next page showing detail of Nissen hut.

·NISSEN·BOW·HUT·

10



WOODWORK			IRONWORK		
	NO			NO	
A BOTTOM BEARERS (IN HALVES)	3	M	RIBS (IN 3 SECTORS)	5	
B FLOOR JOISTS (" ")	13	N	NUTS & BOLTS FOR RIBS	10	
C PURLINS FOR BOWS (" ")	5	O	HOOK BOLTS, NUTS & WASHERS FOR PURLINS	25	
D FLOOR PANELS 9'0" x 4'0"	12		ENDS	50	
E END PANELS RIGHT & LEFT	4		CORRUGATED IRON	75	
F WINDOW PANELS " " "	4		BEARER JOINTS	5	
G DOOR	1		FEET OF RIBS	10	
H END PANEL OVER DOOR	1		SPARE	7	
I END PANEL WITH HOLE FOR PIPE	1		WIRE NAILS 5"	2 1/2	
J MATCHBOARD LINING AMOUNT 6 1/2 SQUARES	6 1/2		WASHER PLATES	25	
SUPPLIED IN 8-100 BUNDLES	3 1/4	P	SHEET IRON CLIPS FOR LINING STRIPS	90	
K LINING STRIPS	48		SPARE	5	
L SHELF & RIFLE RACK (IN HALVES)	2	Q	CORRUGATED IRON SHEETS 9'0" x 2'5"	48	
			WIRE NAILS 5"	5 1/2	
		R	BRACKETS FOR SHELVES	6	

Plate E. Isometric drawing of Nissen bow hut, built of corrugated steel. See plate D on preceding page.



Plate F. Bessoneau hangars shown in plate B. In the right hand shelter may be seen the tail of a plane. The camouflage covering is stretched down over the side supports so as to eliminate tell-tale shadows. See plate G for detail of Bessoneau hangar.

of scattered villages with few individual farmhouses, the land between being subdivided into small narrow fields. In a typical airdrome there may be six hundred ribbon-like parcels of land with perhaps seventy-five individual owners. Nor does this include the Communal woods, the perennial source of fuel for the natives.

These fields are separated from each other by shallow ditches and are graded up in the middle, and the whole surface has to be plowed, cross-harrowed, rolled and seeded. Sometimes, however, an old maneuver ground or stretch of communal grazing land was available for an airdrome and its comparatively level surface greatly reduced the labor and insured a heavier turf.

Normally, an airdrome was designed for one group of three or four squadrons, and according to type this called for twelve to twenty of the larger hangars. These shelters for the planes were generally the Bessoneau or similar model, measuring approximately 70 x 100 feet. The framework of light wooden trusses with metal knuckles and fish plates supported a canvas cover, and over this was stretched the camouflage screen of painted sacking. The wooden trusses were assembled on the ground,

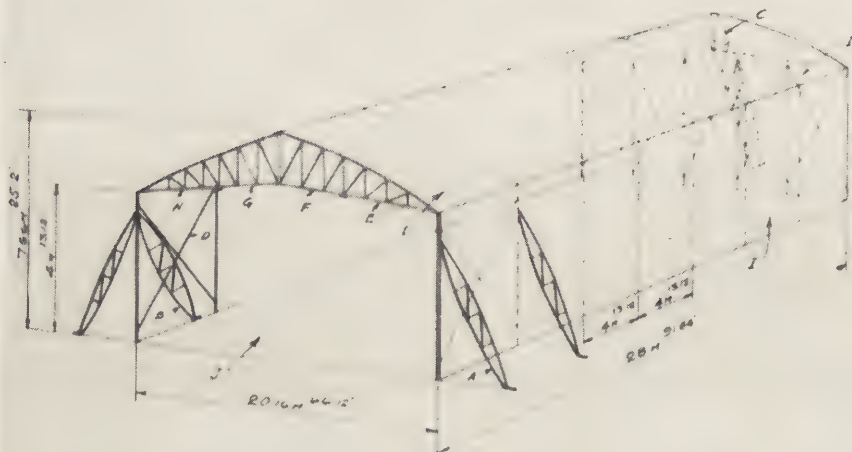
raised into place by means of a long gin pole, and the whole structure anchored to the ground by wire ropes, care being taken that the opening did not face the prevailing direction of the storms. Small tent hangars, for individual machines, were also used on temporary fields or very near the front, within sight of the Germans.

The steel hangars fabricated in America were erected at the depots and at the airdromes which were of a more permanent character. These were of two types, the 100 x 65 ft. and the 100 x 110 ft. clear spans. Riveting was impracticable and wedging was most unsatisfactory, so the members were assembled by bolting. The foundations were either concrete bases or wooden grilles and the sides and roof were of corrugated iron. This model was in great demand in anticipation of its more weatherproof qualities and the possibility of using artificial heat during the winter.

General orders cover the exact number of square feet allowed both the officers and the enlisted men for their sleeping quarters and their mess halls. "Demountable" wooden barracks and huts were used, of Swiss or French make, the first usually six by thirty meters, the latter five by eight. The Nissen hut, made

· BESSONNEAU · HANGAR ·

3



A	BRACES	403
B	BRACES	402
C	BACK BRACE	401
D	DIAGONALS	01
E	TRUSS	71L
F		74L
G		74R
H		71R
I	ROOF SIDES REAR END COVERED WITH CANVAS	
J	FRONT END COVERED WITH CANVAS DRAW CURTAIN	

Plate G. Plan and dimensions of typical wood-trussed Bessonneau hangar used by American and French aviators. See plate F for appearance when covered and camouflaged.



Plate H. "The International Field." Vertical view of airdrome next heavy strip of timber. The faint wavy line, running approximately parallel to the edge of the woods, is a stone highway built for the camp. Some thirty odd barracks are concealed among the trees as a protection from observation and also from shell splinters. Four single and one double hangar have been erected. This field was prepared by the A. E. F., and loaned to a British night bombing squadron which had been bombed out of its own station. Three Handley-Page planes are shown near the hangars. These planes have a stretch of fully 100 feet across the wings. This same squadron made trips to Cologne and other points in the Rhine Valley. After the British had left, the field was occupied by American squadrons, and just before the armistice, was turned over to the French, who were preparing a drive on the east of this region, in exchange for a French field farther north where the American second army was to advance. The flying field extends beyond the upper left corner of the plate.



Plate I. A diagonal view of "The International Field" shown above, with a little French village shown in the valley beyond. The fine lines on the flying field itself show where the harrows were dragged across the French parcels of land after they had been levelled by plowing.



Plate J. View of Air Depot with a flying field in the distance, a branch railroad line leading up to the woods in the foreground and the quarters for the personnel between the two. The road connecting with the main highway in the center is in process of being covered with cinders in order to disguise it at night. One white patch with an auto truck shows the appearance of the road without its camouflage covering.



Plate K. Vertical view of a part of the Depot. The compact French village to the right is typical of the one-road settlement of this region. The railroad yard is shown at the bottom of the plate.



Plate L. Automobile park at depot shown in the gap in the woods at left of plate J.

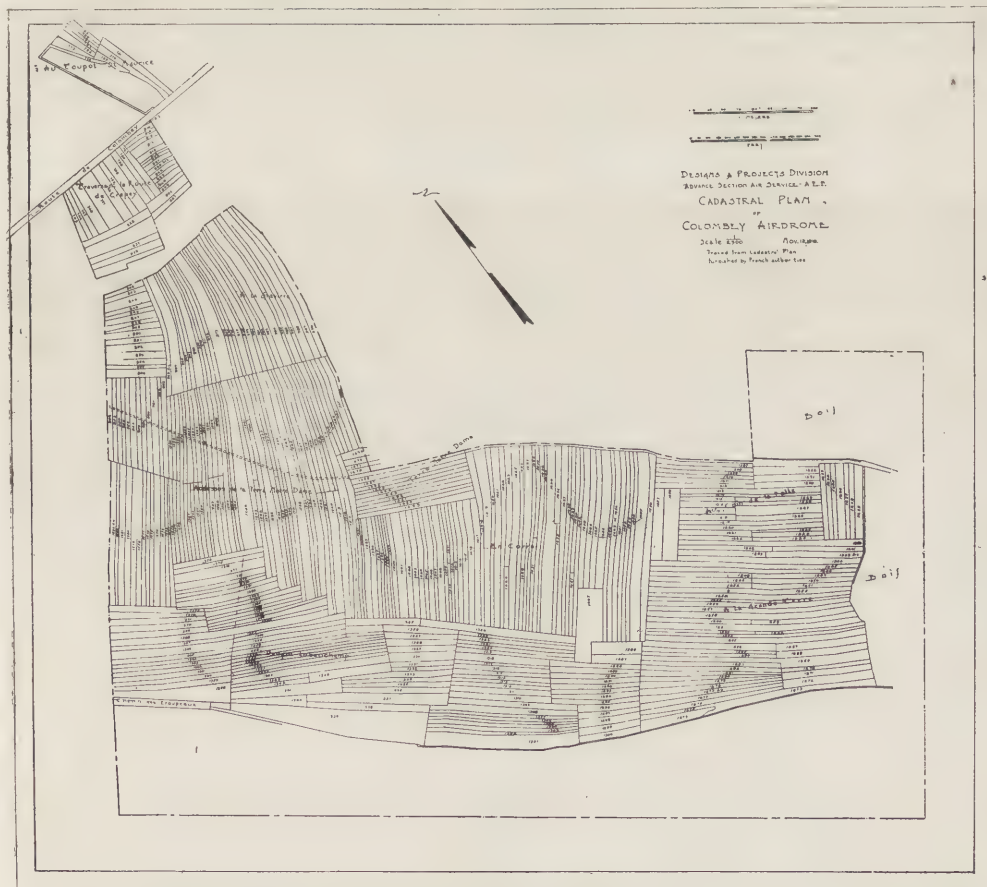


Plate M. Reproduction of Cadastral plan, showing subdivisions of the numerous separately owned fields on one medium sized airdrome. To the right of the field is shown (in blank) the communal woods in which the barracks and hangars were located.

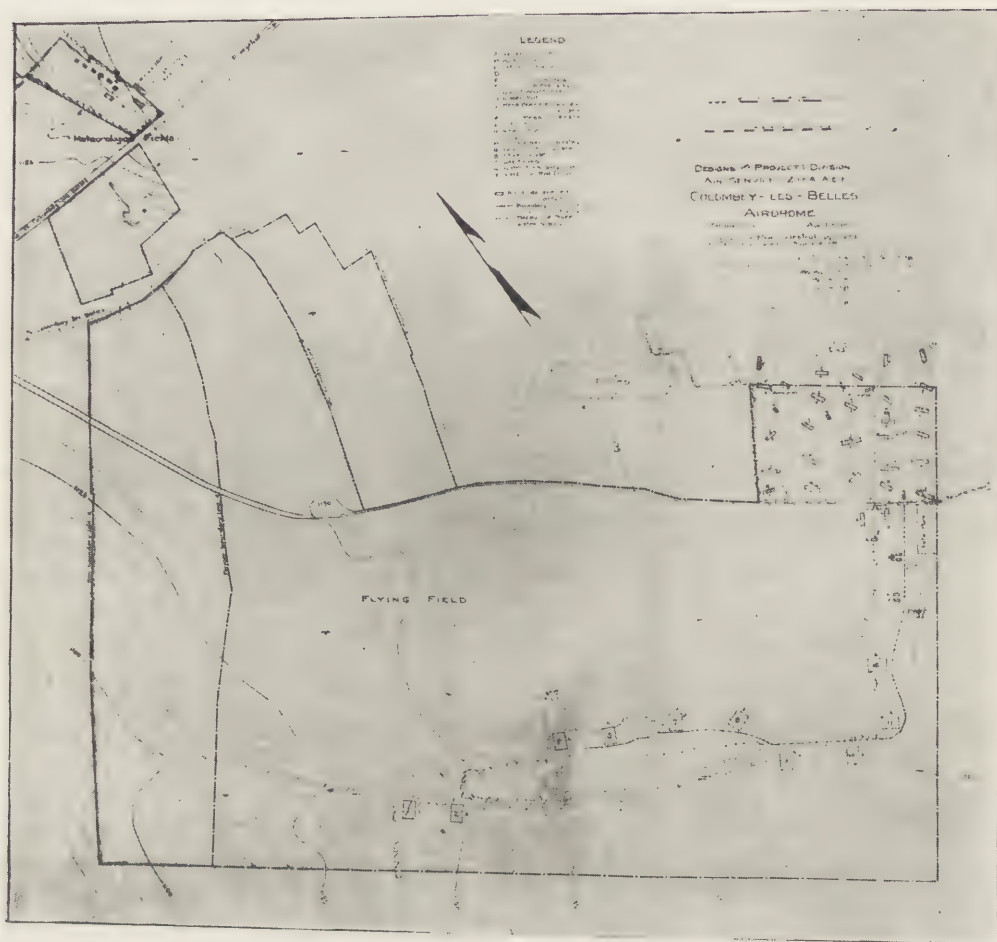


Plate N. Plan showing airdrome on the other side of the town shown in plate K. Plate M shows the Cadastral plan drawing. The meteorological observation station is shown in the upper left hand corner. The barrack shown in plate S is one of the group on the right hand side of the plan above.



Plate O. Part of the 1st Air Depot showing flying field and railroad yard. Plate P shows the plan continued to the right at Colombey-les-Belles. Plate K shows photograph of this layout.



Plate P. Part plan of the depot at Colombey-les-Belles.

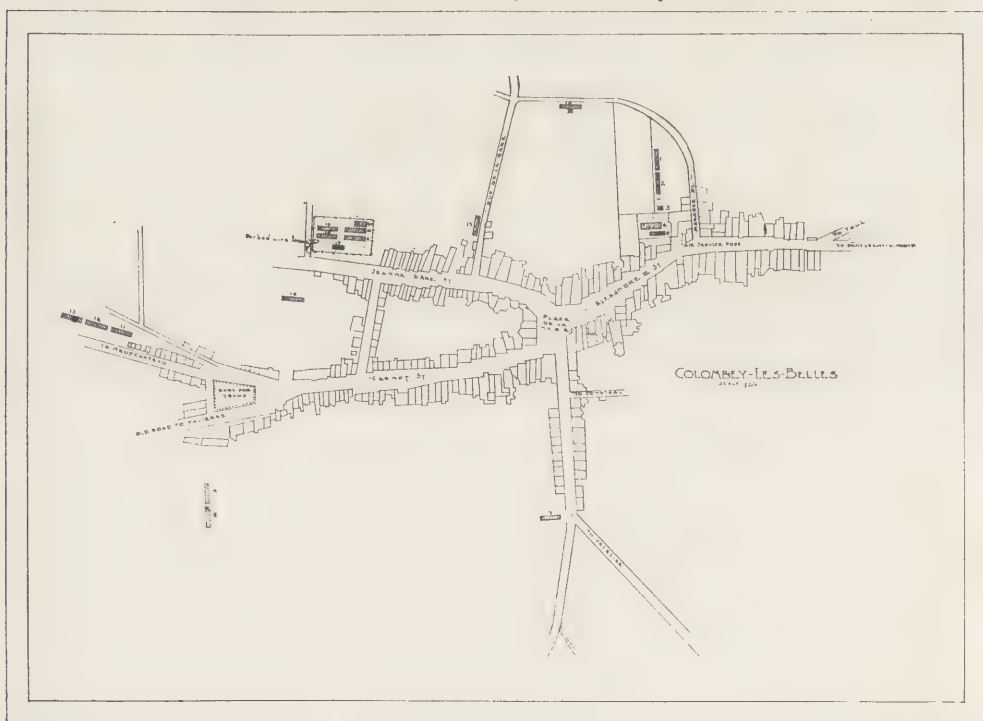


Plate Q. Plan of the village of Colombey-les-Belles, lying between the depot and airdrome of Colombey. The German prison camp, air service headquarters and barracks for casual troops are shown hatched in. Part of the village is shown in plate K.



Plate R. Typical airdrome in wooded country. This shows the largest of the American-built airdromes. Practically all the buildings and hangars are located in the woods. The airplanes are clearly shown on the edge of the field. The edge of a French village is shown on the left of the picture.



Plate S. Barracks in thin woods.

of semicircular sections of corrugated iron, was commonly used for the squadron office, the guardhouse, field stores and the like, while a larger special form with monitor-skylights was adopted for hospitals.

A large barracks capable of housing one hundred men could be erected one day and the brush camouflage on the roof and paint on the sides completed the next. The officers' buildings, headquarters and hospitals were floored; the others left with a packed dirt surface.

If there were available woods, the hangars were embedded along the edge to disguise their location and to gain the protection of the natural splinter screen. The quarters for the personnel were placed at some distance from the hangars for safety, and were also hidden in the timber whenever possible.

The ideal airdrome was located near a highway to reduce to a minimum the building of new roads in the much advertised mud of France. The stones collected from the flying field were used for surfacing; but larger blocks were quarried from the soft limestone strata below the soil, to form a roadbed which in the rainy season would stand up under the heavy trucking of the water-tanks, gasoline convoys and general service. The quarried excavations were used as shelter pits.

Some of the features required in a complete plant were intercommunicating telephones with connections to the French and American trunk lines; bathhouses

with showers for the officers and men; automobile parks and repair shops; bomb-storage pits and bomb-shelter trenches; high dirt butts where the planes could synchronize their machine guns fired through the whirring propeller blades, and, for night-bombing or night reconnaissance squadrons, landing and signal light systems run by generators mounted on trucks.

The air depots lie back of the combat zone and are large airdromes plus a repair base, replacement station (both for men and machines), and general supply and commissary stores. The main characteristics were the railroad sidings, the shops, and the housing for a personnel of three thousand or more, rather than the six to eight hundred on a flying field. Also there were the emergency landing fields, without any buildings, some just back of the artillery pits where the "busses" shot up over "No Man's Land" could find refuge, and others a hundred miles back for the "ferry pilot," should the new plane develop engine trouble when he was flying up from the big production or training centers far to the south.

Among the adjuncts to the advanced air service were the protective anti-aircraft batteries, the huge listening drums, the "light-houses" scattered along the front for the use of the night bombers, and the headquarters settlements from which ramified the control of the aeronautical organization covering the American sector.

A POST-WAR CONSTRUCTION PROGRAM

THE BUILDING BUREAU *of the* INTERNATIONAL COMMITTEE *of the* Y.M.C.A.

PART II

By Charles C. May

IN THE previous number we sketched the organization and activities of the Building Bureau of the International Committee of the Y. M. C. A. We showed that it is a technical board within the general organization, devoting itself to the task of insuring the production of the best buildings, architecturally, functionally, and financially, which can be devised; that the bureau does not usurp any of the functions of the architect, but makes available for his use a vast fund of information both in planning principles, points of operation, and in every minutest detail of design and material. We spoke of the bureau's two classes of service—the Complete, in which preliminary sketches up to the point of selecting a plan, are prepared by the Bureau itself, and the Advisory, in which the Architect prepares the studies, with the co-operation of the central body; we spoke, too, of the contractual relations between bureau, owner (that is, the local Y. M. C. A.) and Architect, pointing out the reasons why a fixed fee, determined in advance, is preferred to a percentage commission; we also touched upon some of the processes of analysis by which every plan is subjected to an acid test as to initial cost, durability, and maintenance charges before final approval by the organization.

Upon reading for the first time of the appearance of a new bureau of whatever nature, one's primary reaction is rather likely to be one of weariness. For it is both true and unfortunate that official bureaus have, in a multitude of cases, fallen very much short of the promise of their prospectus. And it is freely admitted that there are certain

dangers which are likely to appear, so that the sooner they are frankly faced the more easily may they be avoided. These dangers seem to be inherent in the official bureau as such. For the moment we are interested in them as they might affect the Building Bureau of the International Committee of the Y. M. C. A.

The first tendency is for a bureau to become, if you please, bureaucratic—to adopt a formula and apply it to every problem as it appears. This is a form of disease which has often attacked officialdom—one which is most prominent in having made certain departments a byword within the nation. The public has sometimes come to feel that it is more important to know the formula and to meet it than to offer a solution of the problem. One of the chief virtues, then, which must be sought after and clung to by any bureau is that of continued open-mindedness.

Besides the tendency toward dogmatism, there is on the other hand the possibility of stagnation.

In governmental work, the civil-service job has not attained fame in the production and retention of high-spirited, keen, animated service. Dry rot, once started, is not an easy thing to stop, and wherever the element of routine becomes paramount in a job the germ of dry rot is present.

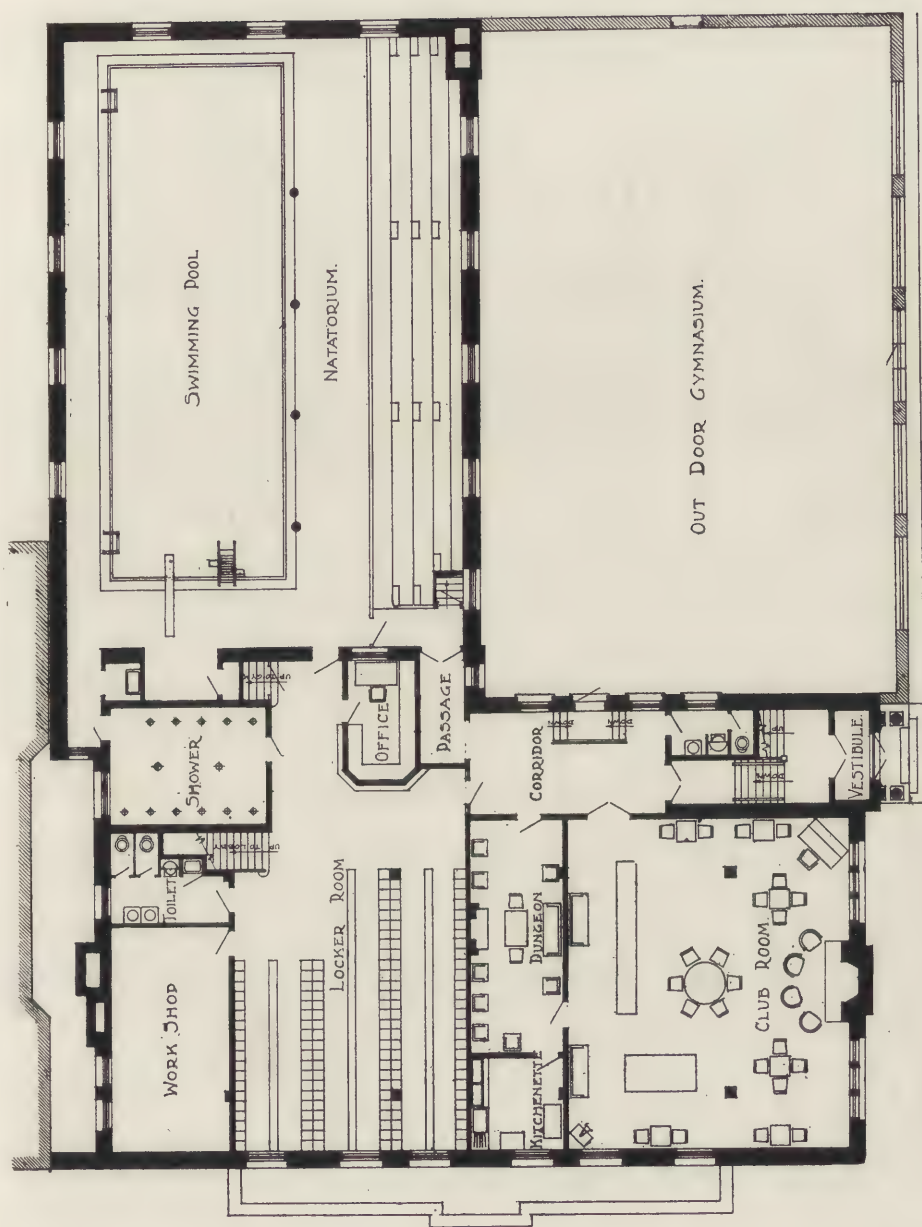
We should not feel free to speak so gloriously of the pitfalls that lie in wait for the official bureau, if we felt that these evils were destined immediately to lay hold upon the Building Bureau of the Y. M. C. A. Quite on the contrary, we believe that there are good reasons for expecting this particular bureau to



BOYS' BRANCH OF THE Y. M. C. A. AT DULUTH, MINNESOTA.



LOBBY OF THE BOYS' BRANCH OF THE Y. M. C. A. AT DULUTH, MINNESOTA.



BASEMENT FLOOR PLAN OF THE BOYS' BRANCH
OF THE Y. M. C. A. AT DULUTH, MINNESOTA.



A CORNER OF THE LOBBY. BOYS' BRANCH OF THE Y. M. C. A. AT DULUTH, MINNESOTA.

avoid these pitfalls altogether. To examine some of these reasons—first, the element of routine work is, comparatively, very small indeed. Plans submitted to the Building Bureau are examined, not primarily to find out whether a set of laws have been complied with—they must rather be analyzed in the most painstaking way to prove whether or not they meet broad requirements, dictated by general principles. It is not a question of whether sizes of plumbing pipes are within the code; but of whether, with the existing conditions, site, appropriation and the rest of it, the proposed plan offers the best solution.

And this brings up at once a second point. In the process of this analysis and testing, the bureau is brought constantly into touch with the mind of the designer—a mind which is attacking the problem freshly, from a new angle, and bringing the viewpoint of another personality to bear upon the issue. Assuming that there

were a tendency within the bureau toward relaxing this constant contact with a succession of professional planners—not junior draughtsman sent to “file drawings,” but principals in whose minds the design had its conception, and who are ready to defend their mental offspring with some spirit—this sort of contact (such constant meeting of minds) is admirably adapted to produce constructive thinking.

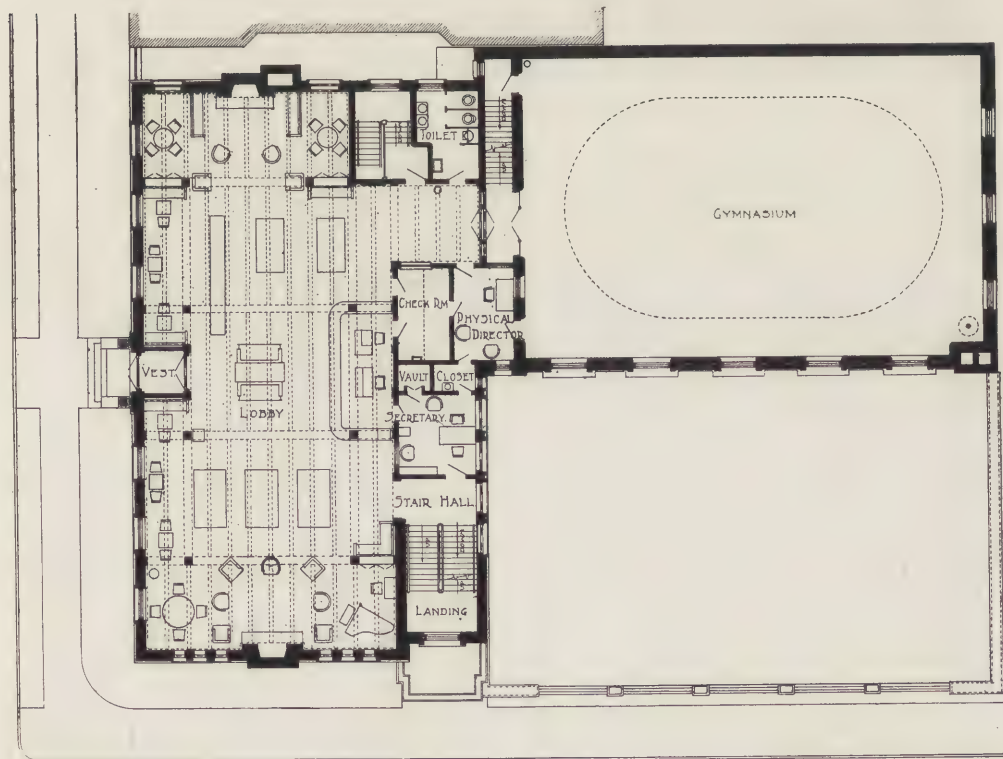
Add to these another item—that each case is an individual problem, and must be studied *de novo*. The size and character of the city where the proposed building is to be set up, the different classes of membership anticipated, their relative numbers and importance, the kind of service the organization proposes to give them—all these and a half-dozen more considerations are variables which must be determined in the individual case, and examined before acceptance. In effect, the bureau must go through all

the processes of preliminary studying, sketching, comparing and eliminating which must be passed through in the development of plans in any architectural office.

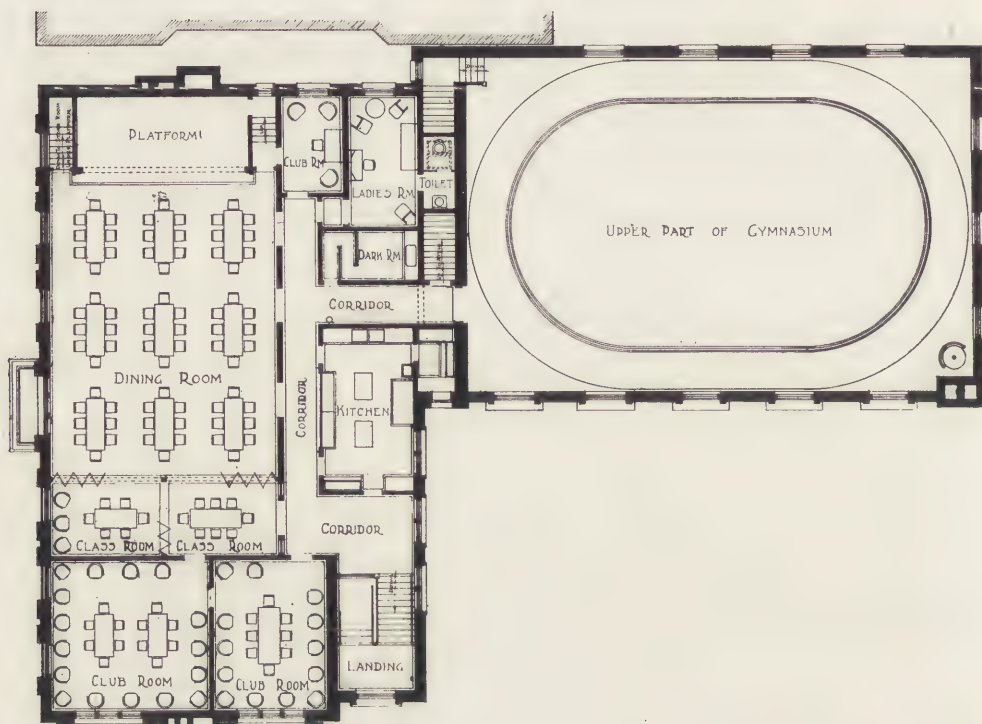
But the most salutary feature of the whole situation is found in the nature of the work itself. As we noted, in passing, last month, the Y. M. C. A. building is first of all a planning problem and one which is by no means a static proposition; it is constantly in process of evolution, and the bureau must perforce keep pace with the current or become submerged. Not long ago an architect who specializes in schools published a book in which was given a great amount of information, detailed and illustrated—apparently the whole story of school design. "But look here," said his friends, "you have spent years collecting this information. How can you afford to hand it out to the public in this fashion?" "That's all right," the architect answered,

"by the time these schools are published I'll be building them some other way." His experience of the rapidly changing practice in school design is hardly exaggerated as applied to that of the Y. M. C. A. building. What was standard yesterday is obsolete today; what is to become standard tomorrow must be the result of diligent study today.

We have been wont to make large statements as to the speed of developments during the last century; but today we know that more fundamental changes have been packed into the past four years than occurred in any of the previous periods, a dozen times as long. If, then, good architectural practice has previously been in a continual state of revision and shift and advance, we must expect with the new era of construction a definite speeding up of the process of evolution in methods and procedure. To keep abreast of the times will be no small job; to keep ahead of them, to foresee tendencies



FIRST FLOOR PLAN OF THE BOYS' BRANCH OF THE Y. M. C. A. AT DULUTH, MINNESOTA.



SECOND FLOOR PLAN OF THE BOYS' BRANCH OF THE Y. M. C. A. AT DULUTH, MINNESOTA.

and to anticipate needs will tax the ability of any bureau, no matter how keen the personnel. Taking these features into account, we are justified in feeling that the conditions surrounding the Building Bureau of the Y. M. C. A. are decidedly different from those usually attendant upon departmental work; that the most potent factors will work toward, instead of against, the effective life and influence of the organization.

To make more concrete by illustration some of the newer lines along which the bureau is working, it might be well to describe more in detail the Community Type of Y. M. C. A. Building, which was mentioned last month. This is an outgrowth from a class of work which has been going on for a considerable time in the rural districts, in residential suburbs, and oftentimes in the county seats. It had come to be known within the organization as the non-equipment work, because the Y. M. C. A. has sought, without a building of its own, to organize and

develop the recreational life of such districts.

It has been found, however, that, using all the equipment available in the community, there is not enough properly to accommodate the various units when organized. The problem therefore becomes the double one of producing the organization and then of housing it. This the Y. M. C. A. undertakes to do in its Community Type of building—a place where a number of local units of social life may be assured of meeting rooms, social rooms, gymnasium, etc., all with adequate equipment and reserved for their individual use on certain evenings arranged in schedule form by the local secretary.

It is obvious that the building which is to express such a program must be planned along rather different lines from those of the usual Y. M. C. A. building. The emphasis here is placed upon independence of several equally important units rather than upon the central organ-

PER CENT OF CUBICAL CONTENTS OBTAINED BY ANALYZING 6 ACTUAL BUILDINGS.

TYPE OF BUILDING	ACTIVITIES				GEN'L UTILITIES		MEMBERSHIP FEATURES		WHOLE BUILDING		
	SOCIAL	RELIGIOUS/EDUCATION	PHYSICAL	SERVICE	HOUSE	MECHANICAL	ACTIVITIES	GENERAL UTILITIES	ADMINISTRATION	RECREATION FEATURES	DORMITORIES
LARGE INDUSTRIAL PLANT BLDG.	26%	27%	37%	10%	74%	26%	76%	22%	2%	83%	17%
SMALL " COMMUNITY BLDG.	29%	35%	36%	—	66%	34%	88%	11%	1%	91%	9%
TYPICAL BLDG. FOR MEDIUM SIZED CITY	20%	14%	63%	3%	74%	26%	84½%	14%	1½%	76%	24%
" " " SMALL " "	29%	3%	61%	7%	68%	32%	82%	14%	4%	77%	23%
BRANCH " " " LARGE CITY	27%	6%	59%	8%	70%	30%	81%	16%	3%	57%	43%
SMALL TOWN BLDG.	22%	8%	68%	2%	57%	43%	80%	18%	2%	80%	20%

PLAN SHOWING RELATIVE SPACE ALLOTTED TO Y. M. C. A. ACTIVITIES.

ization, for there may be several groups operating in the building on the same evening.

For this type of building, with so many separate activities going on at once, side by side but quite independent of one another, the units within the building must be flexible, interchangeable, and yet capable of central control. This will be furnished by the local secretary, who might combine the office of building manager and physical director. In the building also will be offices for the community-wide secretaries of the Y. M. C. A. and Y. W. C. A.; so that these organizations may keep in touch with the life of the entire town through this focal point of its social groups.

Another of the newer branches of work, the industrial, has had the result of producing for the new period of permanent building a Y. M. C. A. type somewhat akin in its simplicity and economy to the more substantial of the buildings erected under the war construction program. This part of the outfit will be found, as its name implies, in the larger industrial centres, and at the plants themselves in cases where single industries employ great numbers of men and women. There are two kinds of work carried on under these conditions—first, that of Americanization. For this there is established a branch building within the home colony where the foreign elements live, and the work is primarily aimed at the teaching of the English language, preparation for citizenship, and acquaintance with American institutions and ideals. The building combines with class rooms for this educational work, social units and gymnasium, which also, in small buildings, is fitted with moving

picture equipment. There is furthermore a refreshment bar, so that the building may become attractive enough to compete successfully both with the movie and the saloon.

Besides these neighborhood units there are the plant buildings which occupy the general position of a central branch Y. M. C. A. These often make provision in their social units and equipment for men, women, and boys, including a gymnasium and again the moving picture auditorium.

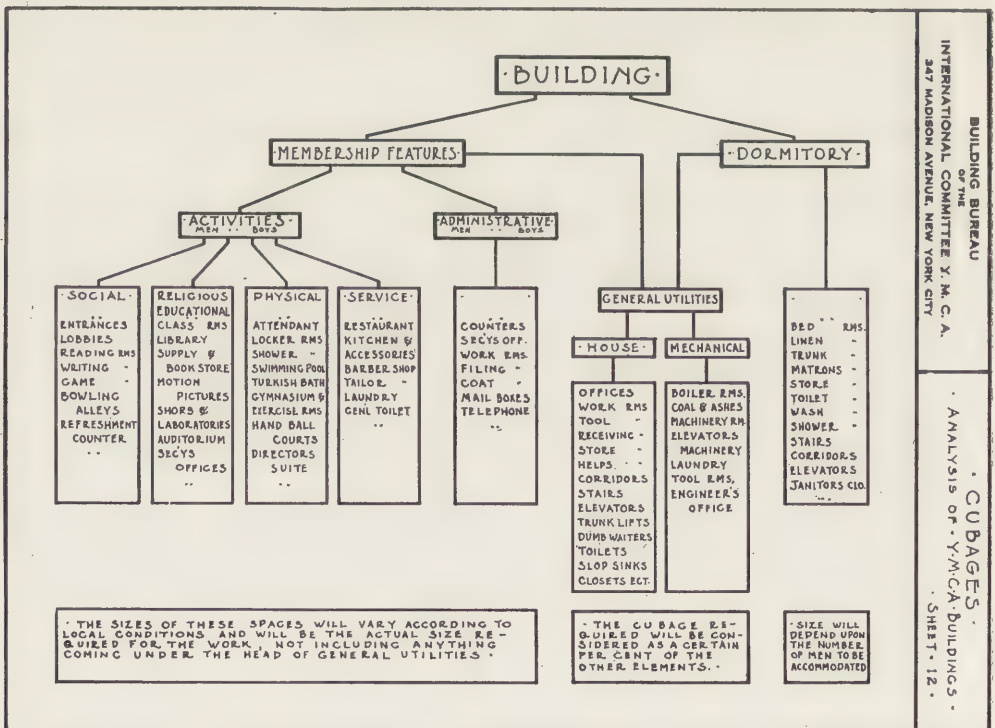
Aside from the development of new types of buildings to meet new requirements and conditions, the Building Bureau is carrying on intensive studies of the older types. It is, for example, making careful surveys of the possibilities of lots of varying sizes and shapes. That is, it is collecting information as to just what can be expected on the city lot of say, 50, 60, 75 or 80 ft. by 100 feet deep; then the same widths by a greater depth, up to 200 feet, which is about the limit of variation encountered in practice. And it should be noted that the purpose of these studies is not that of producing a set of standardized plans to be used upon a site of any given size like a ready-to-apply plaster. It is rather in order to be equipped with real knowledge as to the possibilities and impossibilities in these various cases, so that when a local building committee turns up saying "we have a lot 80 by 150 feet, and we propose to put on it a building of such and such accommodations," the Building Bureau will be ready to come back with an answer bearing weight. They will say either: "Yes, that would be fine if it could be done, but, unfortunately, it does not work out," or in rarer cases of good fortune: "Yes, you can do all that, and besides you

can get in this and that additional." The Bureau is also tackling the closely related questions involved in the cost of land as against the height of the building; the combination of a larger lot on low-priced land, with a building of much outside wall, foundation and roof, as against the smaller plot on high-priced land with a building more compact, but higher, with more structural steel and more elevators to build and run.

Still another form of analysis which should produce valuable results is one seeking to determine what proportionate parts of the building should normally be occupied by its several forms of activity. To explain this somewhat: In every building of every size there are certain subdivisions of function which occupy their several fractions of the whole. The Building Bureau are asking themselves whether there is a normal fraction to which each subdivision is entitled, and by which, in the case of new plans, whether of the hundred thousand dollar or the half-million type, a wasteful layout may

be quickly exposed by its deviation from the normal. Such laws can be propounded only by the analysis of great numbers of plans, testing the normal and accounting for the abnormal, just as, in a parallel case, the community planner knows that if a housing subdivision shows 25 per cent. of its area in roads, 10 per cent. in parks and 65 per cent. in salable lots, he has not gone far astray.

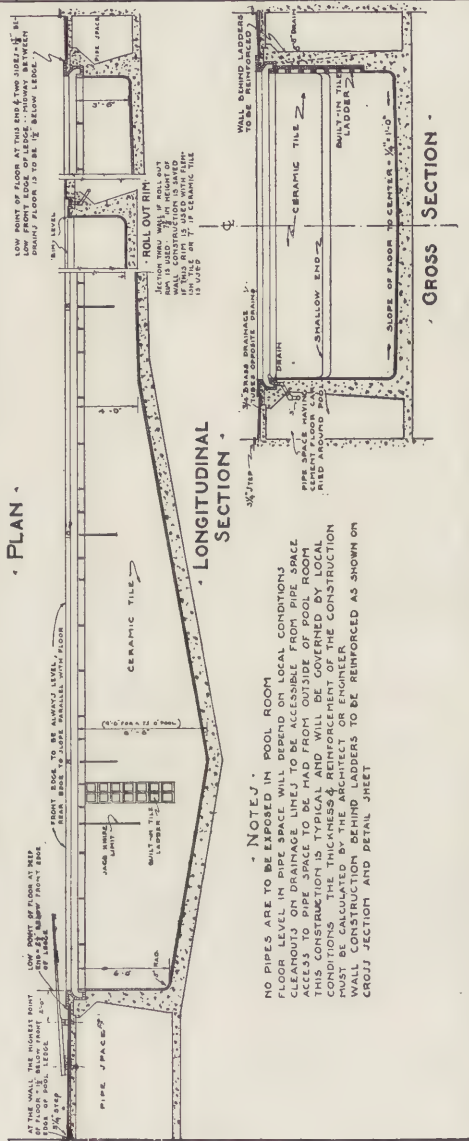
The Building Bureau has carried its analysis down to the ultimate subdivision—that of the individual room. Beginning, however, at the other end, the main headings are: first, the Activities Section. This carries its own subdivisions, which explain themselves in the naming—there are the social, the religious and educational, the physical, and the service. This last, however, means service not in the sense of kitchen and pantry dependencies, but organization service to its members and others who use the building. The second main section is that of Administration, including, of course, all the offices and accessories



CUBAGE ANALYSIS AND INTER-RELATION OF DEPARTMENTS IN Y. M. C. A. BUILDINGS.

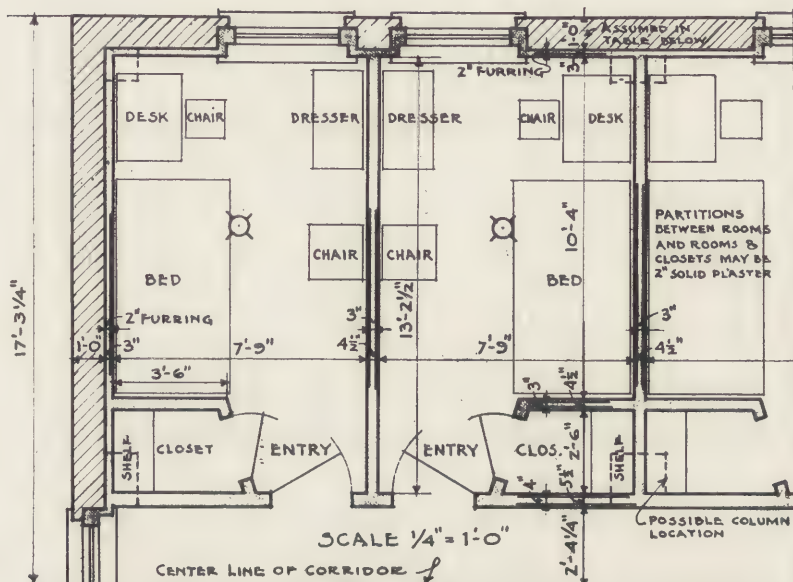
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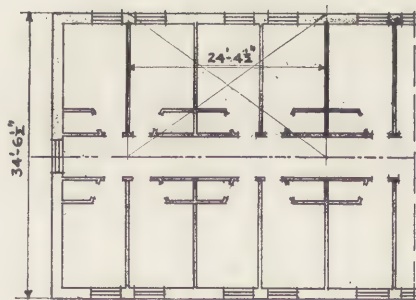


BUILDING BUREAU
OF THE INTERNATIONAL COMMITTEE
OF Y-M-C-A
347 MADISON AVE., NEW YORK CITY

DORMITORIES - TYPE "A" SINGLE ROOMS
- MINIMUM SIZE -
SCALE $\frac{1}{4}" \& \frac{1}{16}" = 1'-0"$ NUMBER 601 A



NOTES: WHERE CLIMATE WILL PERMIT, FURRING MAY BE OMITTED ON EXTERIOR WALLS. MINIMUM ROOM SIZES ARE GIVEN HERE. IF COLUMNS ARE REQUIRED, AS SHOWN BY BROKEN LINES, THESE SIZES MAY BE INCREASED. HEATING DEPENDS ON CONDITIONS.



SCALE $\frac{1}{16}" = 1'-0"$

TABLE FOR COMPARISON
BASED ON 3 ROOM GROUP

AREA OF SINGLE ROOM EX- CLUSIVE OF CLOS. & ENTRY	80 SQ. FT.
AREA OF GROUP	421 SQ. FT.
AREA OF SINGLE CLOS.	9 SQ. FT.
AREA OF GROUP CLOS.	27 SQ. FT.
CUBICAL CONTENTS - 10'-0" ASSUM- ED HEIGHT FL. TO FL.	4,210 CU. FT.
CORRIDOR PARTITION - 24'-4 1/2" LONG	
OTHER PARTITIONS	58'-1 1/2" LONG
NUMBER OF DOORS	6

"TYPE A" SINGLE ROOM DORMITORY
PLAN FOR Y. M. C. A. BUILDINGS.

DORMITORIES - TYPE "B" - SINGLE ROOMS
~ MINIMUM SIZE ~
SCALE: $\frac{1}{4}" = 1'-0"$ NUMBER 601 - B

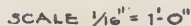
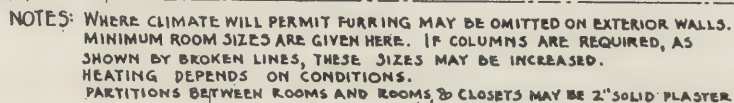
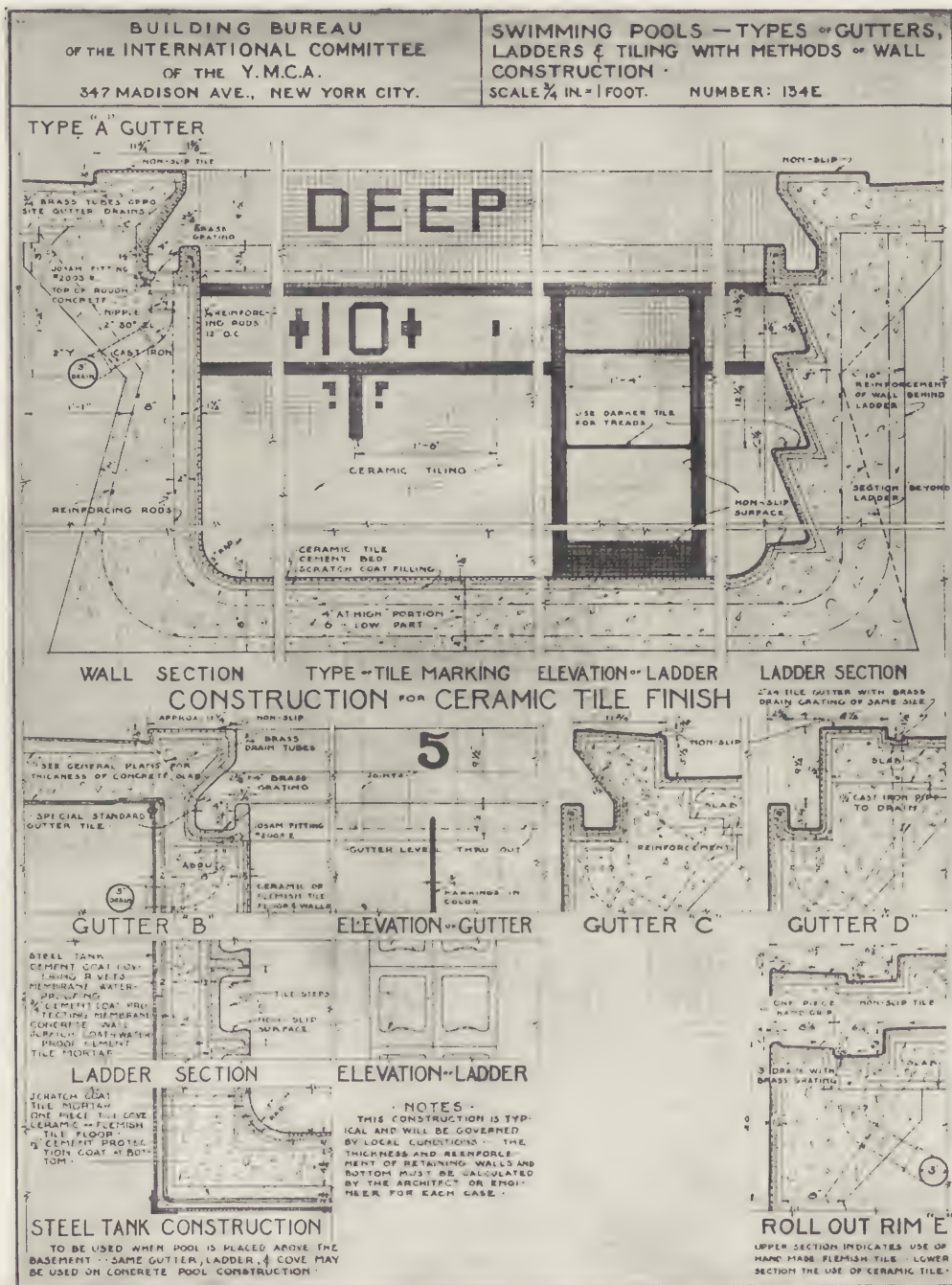
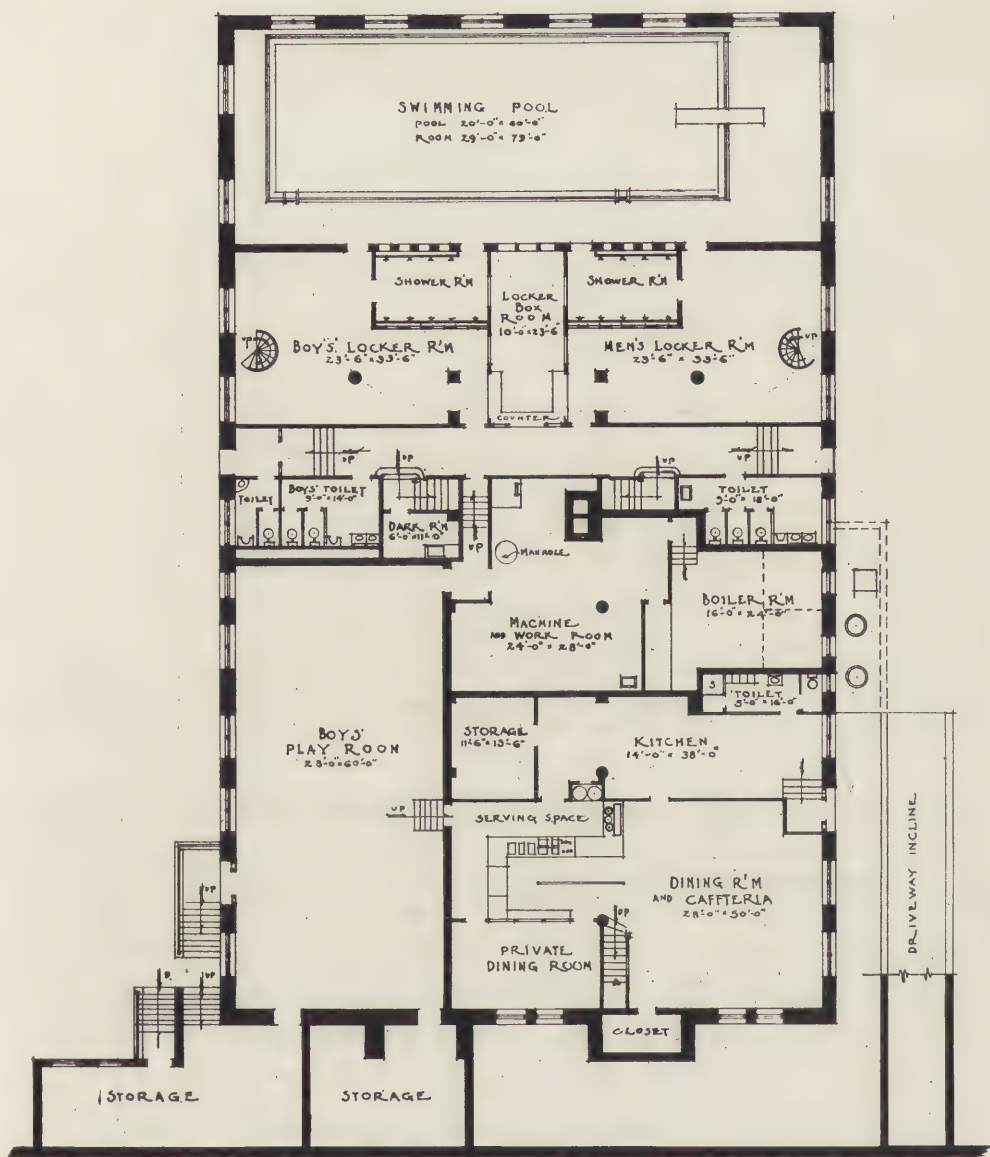


TABLE FOR COMPARISON BASED ON 3 ROOM GROUP	
AREA OF SINGLE ROOM EXCLUSIVE OF CLOSET AND ENTRY	80 SQ. FT.
AREA OF GROUP	394 SQ. FT.
AREA OF SINGLE CLOS.	6 SQ. FT.
AREA OF GROUP CLOS.	18 SQ. FT.
CUBICAL CONTENTS - 10'-0" ASSUMED	
HEIGHT FLOOR TO FLOOR	3940 CU. FT.
CORRIDOR PARTITION	26'-0 1/2" LONG
OTHER PARTITIONS	47'-10 1/2" LONG
NUMBER OF DOORS	6

"TYPE B" SINGLE ROOM DORMITORY
PLAN FOR Y. M. C. A. BUILDINGS.

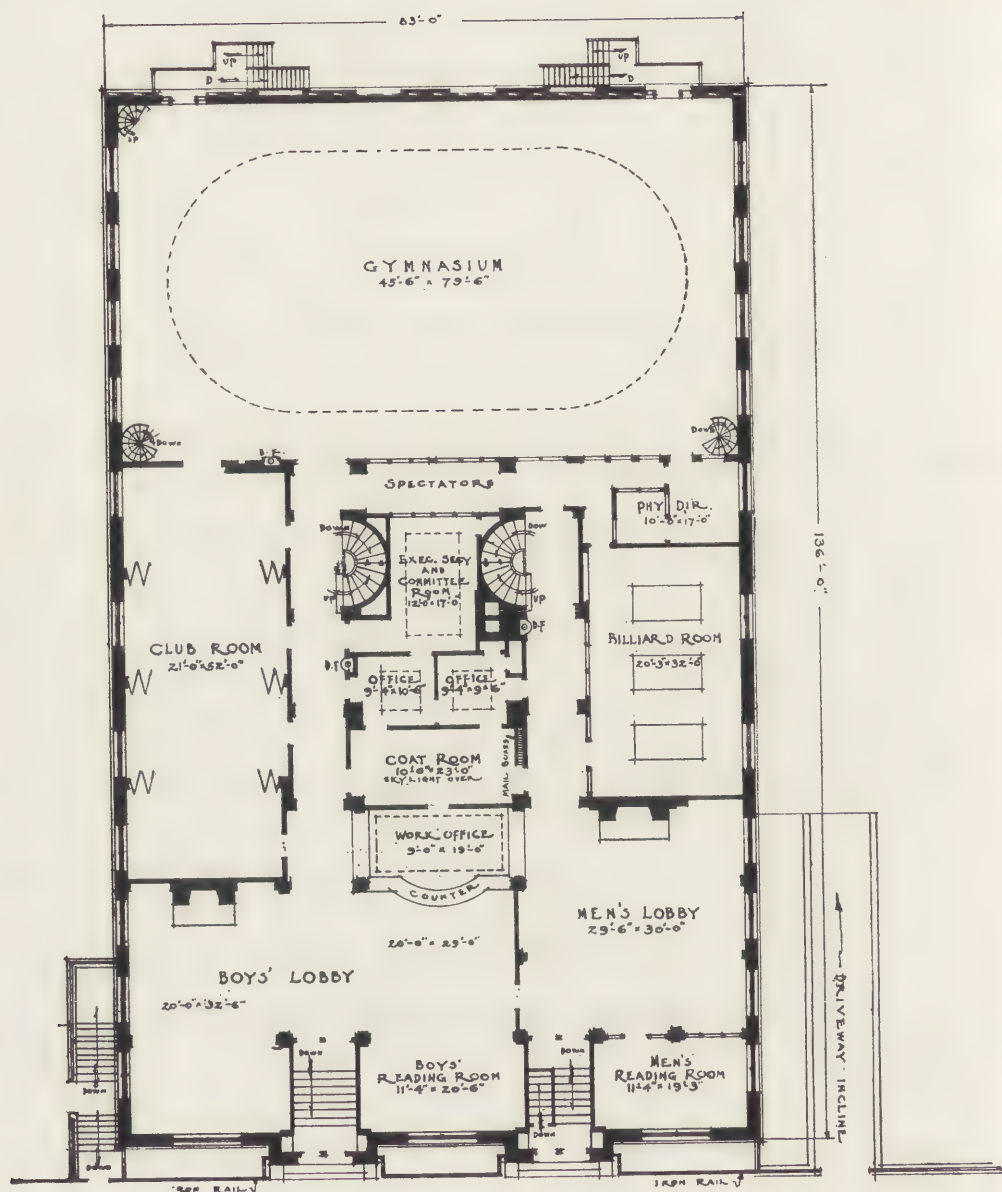


TYPE DETAILS OF SWIMMING POOLS FOR Y. M. C. A. BUILDINGS.



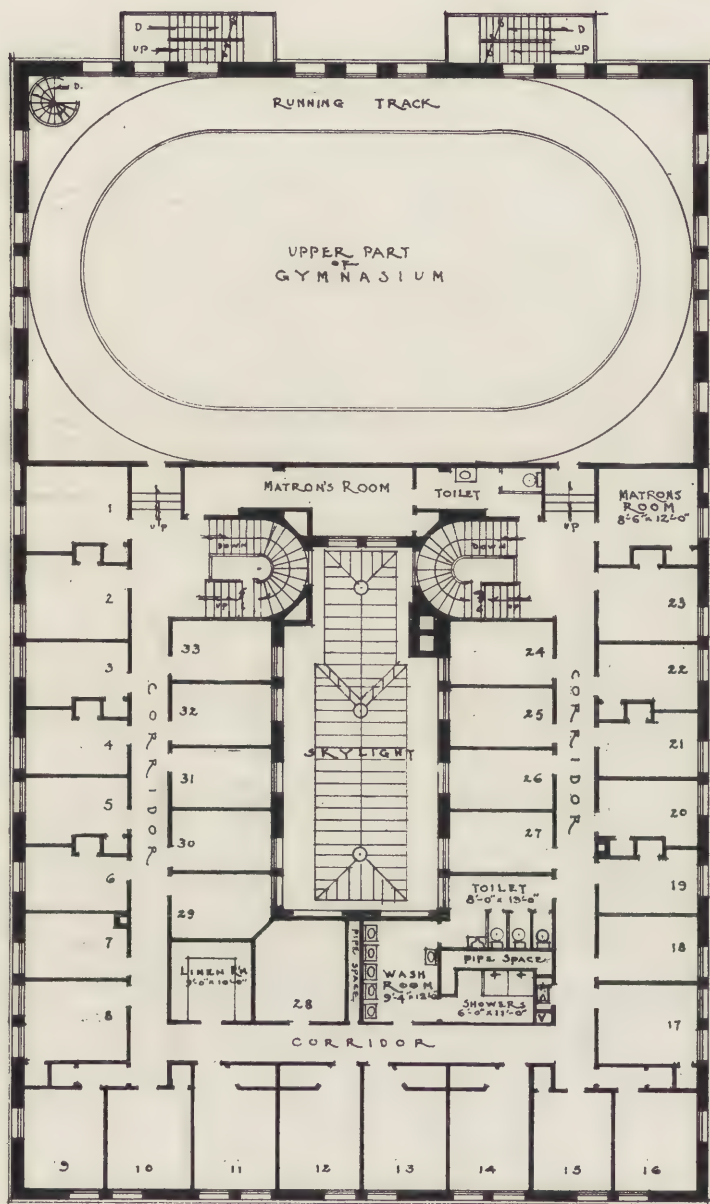
GROUND FLOOR PLAN
SCALE $\frac{1}{16}" = 1'-0"$

NORTH SIDE BOYS' CLUB
OF THE Y.M.C.A.
CHICAGO ILLINOIS



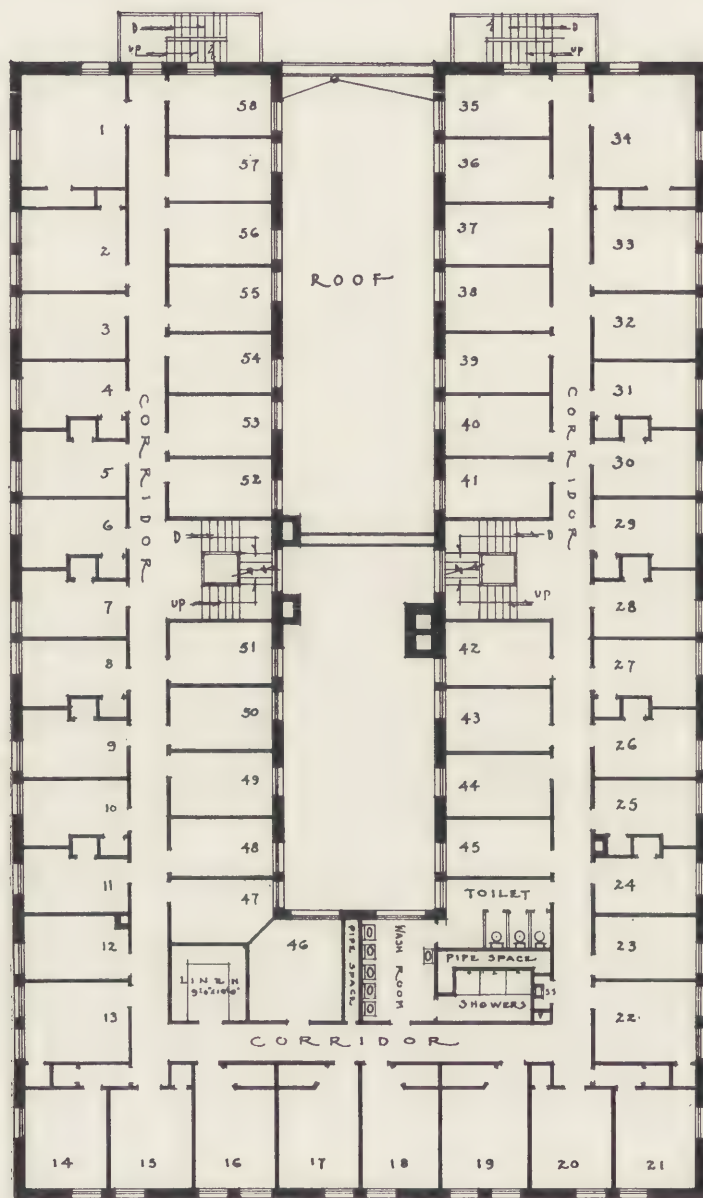
MAIN FLOOR PLAN
SCALE $\frac{1}{16}$ " = 1'-0"

NORTH SIDE BOYS CLUB
OF THE Y.M.C.A.
CHICAGO ILLINOIS



SECOND FLOOR PLAN
SCALE $\frac{1}{16} = 1'-0"$

NORTH SIDE BOYS CLUB
OF THE Y.M.C.A.
CHICAGO ILLINOIS



THIRD FLOOR PLAN
 SCALE $\frac{1}{16} = 1'-0"$
 (FOURTH FLOOR SIMILAR)

NORTH SIDE BOYS CLUB
 OF THE Y.M.C.A.
 CHICAGO ILLINOIS

necessary for the organization in its carrying on of the work program. For the third section we have the Dormitories, including corridors and closets; and finally there is the section devoted to General Utilities. This takes care of such things as toilets, kitchen, serving rooms, etc., together making up the House Department, and also the boiler rooms, coal bunkers, pump and elevator machinery rooms, and such like, which make up the Mechanical Department of General Utilities.

Of course, certain of the large units in such a tabulation are definite and nearly constant, such for instance, as the swimming pool; but even there, its dependencies in the locker rooms, showers, etc., vary with the membership and the size of the building, so that the percentage of its area to the whole is more nearly accurate than one would offhand imagine.

Another special type of plan that is to be investigated by the Bureau is one which would prove most valuable in cases where peculiarities of site make excavation difficult or expensive. In every ordinary situation it may be assumed that economy in structural cost and in operation point to placing in a basement story not only the boiler room, coal bunkers, machinery rooms, and store rooms, but swimming pool, locker rooms and numbers of such utilitarian features. For the proper lighting and ventilating of this floor it has been customary on level sites to raise the main floor level to about five or six feet above the sidewalk. Supposing now, that a building site lay on ledge rock, with buildings adjoining at the lot lines, or supposing an extreme condition of water pressure; what, the bureau is asking, will be the net result in the showing of our building if we put it up without a basement at all? That is to say, the first floor level would be perhaps two feet above the sidewalk level, and that story would contain a combination of the features usually found on the first floor and in the basement; it thereby relegates to a second floor (assuming the lot size is not increased for the sake of the special type of building) some of the other rooms usually in close junction with the main administrative offices. The only

excavation would then be for walls, for a low pipe gallery and for the heating plant. The building is thus pulled out of the ground or raised higher in the air, the total cubage remaining about constant. Whether this sort of alternative, when reduced to its lowest terms, can be propounded in the form of a law, may be doubted; local conditions cannot be eliminated and they have disconcerting ways of upsetting the most perfectly formed theorem; but there is no gainsaying the fact that such investigation will produce knowledge, and all added knowledge is in the line of progress.

Still another of the directions in which changed conditions can be noted is that of the increased emphasis which is being placed on the boys' work. In this the Y. M. C. A. is being followed by other organizations; the National Lawn Tennis Association has, in the past five years, revolutionized its attitude toward and its treatment of the youngsters. From being ignored or kicked off the courts as a nuisance, they have been elevated to a place where they are now given every facility and encouragement in the development of a healthy young body of players. So with Y. M. C. A. work; formerly the boys were either forgotten, or relegated to cramped quarters in a basement or second floor, being treated much in the light of a necessary evil. Gradually, a change has taken place, as the general organization has perceived that nothing is more important than providing the early implanting of the finest ideals of manhood, and that in doing so the best way is to gain the confidence and the interest of the man while he still is a boy. So the buildings immediately reflect the changed attitude, until at present the equipment for carrying on the boys' work is treated on an even basis in quality and in space with that of the men. We find now the boys provided with their own entrance (not an obviously side door, but a real one like the men's), their own lobby, social and clubrooms, lockers and all the rest. Indeed, the process has in a few cases been carried to its ultimate conclusion, and the boys have been furnished an entirely separate building. One of these, located at

Duluth, Minn., is illustrated herewith, and shows an excellently planned and very attractive building.

The Building Bureau of the International Committee of the Y. M. C. A. is a distinctly new era movement. It looks upon the constructional program that stretches before the organization in the big way which the project justifies. It puts the conduct of such construction,

from the point of view of the organization, upon a business basis, and provides for the gathering of information such as will make the Bureau the final authority on every aspect of its subject; and, finally, it places before the architects of this country the opportunity to take part in planning one of the most important single classes of building in the constructive period which lies just ahead.

MODERN INDUSTRIAL PLANTS



By George C. Nimmons

Part VI-a

THE EXCESSIVE TURNOVER OF LABOR AND THE INFLUENCE OF EMPLOYEE'S WELFARE WORK IN REDUCING IT.

IT requires a tremendous upheaval in the world's affairs to interfere perceptibly with the regular continuance of human activities, and especially in the industries where the momentum of daily necessities keeps turning the wheels of its operation in spite of almost any opposing force or agency. In the past there have been few occasions where anything seriously interfered, or even materially retarded, the continuous whirl of industrial progress. Yet the close of the war has brought about a condition where it appears as if a large part of the machinery of human activities has been stopped, and where the undertaking commonly called reconstruction is really more like the operation of getting the wheels to turn again with their accustomed velocity than it is like rebuilding. At any rate the people now have a chance to look the machinery over while part of it is at rest and the other part turning only slowly.

If there were no troubles or no defects, if there were no changes or alterations necessary, the starting and speeding up to old-time standards would give little concern. But the condition of things has been found to be such as to require the most serious consideration before starting up to make the new run.

Never before in this country has there been so much getting together and taking council as to new methods, new poli-

cies and new programs of action for the industries. Every trade and every branch of the industries have recently had their conventions and meetings at which the whole situation has been canvassed and studied with a view of disclosing all those resources and all those opportunities which promise to be most helpful in the new run of their existence.

The most promising opportunities for success do not any longer lie in the direction of labor-saving machinery, as that is already developed almost to its limits in every line, and is also possessed in common by all business competitors. No new advantages seem to lie in the direction of raw materials, their production, transportation or the salvaging or utilizing of discarded residues or parts of material for by-products. Neither is there anything new in science which offers material advantages over and above those which science has already so generously supplied in the past. Science seems to have already done its part, and will, of course, continue to play an essential part; and there is nothing new which it can supply for present purposes, but what all competitors already have. And so all of those things have been canvassed which made the industries successful in the past, and none of them have now been selected as the subjects which promise the most help for the immediate future. Strange as it may seem, the indus-



NOON CONCERT FOR EMPLOYEES HELD IN KODAK PARK AT THE PLANT OF THE EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

tries have now come to a position where they look for the greatest relief and help, not from the material and practical things such as science can furnish, but from the influences and effects which come more from the arts and the teachings of social science than they do from anything else. It looks as though the day of art was really beginning to dawn; because the things which the industries now mostly need to build up their trade and to correct their present most troublesome defects are partly things from the arts. It may not be generally recognized that the arts form the source of these tendencies, but such is the case, and it will be appreciated in due time.

It has so come about in the searching examination and inspection which has been made of the condition of the industries since the close of the war that the greatest handicap to success now is the excessive turnover of labor. The present unrest of labor all over the world

has also emphasized the importance of immediate action in this direction.

The turnover of labor is usually defined as the "hiring and firing" of employees. In order to keep the working force of a plant up to the number required for operation, it has become necessary universally to keep hiring employees continually far in excess of the number that should be required if they were even fairly permanent and constant in their positions. This problem is of serious concern; records and statistics recently gathered having disclosed the fact that the condition is not only having a bad influence on the character of work performed, but is causing a loss and waste of surprising proportions far beyond what had been generally ascribed to it.

The extent to which the turnover of labor has grown may be illustrated by some of the very interesting statistics and data that have been gathered on that subject.



LIVING ROOM IN FIRE DEPARTMENT HEADQUARTERS, EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



FIRE DEPARTMENT OF THE EMPLOYEES OF THE EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



CLASS OF FIRST AID ILLUSTRATING INSTRUCTIONS GIVEN EMPLOYEES IN BANDAGING AND DRESSING INJURIES, EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



ASSEMBLY HALL FOR EMPLOYEES, EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

One of the most striking instances of this is the report of Mr. Magnus W. Alexander of West Lynn, Mass., on the fluctuation of labor in twelve industrial plants engaged in the metal industries, located in six different states. The material for this report was gathered during the year from January 1, 1912, to January 1, 1913, just before the war, when conditions were considered normal.

The products of these plants varied in size and kind from large steam engines down to fine tools and instruments, requiring from 300 to 10,000 employes at a single plant.

At the beginning of the year when the investigation started, the twelve plants had 37,274 employes and at the end of the year, December 31st, when the statistics were completed, the working force had been increased by 6,697 to take care of increased production, making a total of 43,971 employes. During the year,

however, 35,874 dropped out of their employment for one reason or another, making it necessary to hire 42,571 new people during the year in order to keep all positions filled and supply the 6,697 additional employes needed for the increased production. In other words, it was necessary to hire six and one-third times as many people as the 6,697 new people who constituted the increase in the force for the year.

In accordance with mortality tables, the average length of service in factories is $31\frac{1}{2}$ years for men and 23 years for women, and from these records Mr. Alexander computes the average death rate for the ordinary industry at one per cent of the total employes per year. Four per cent as a rule are sick each year long enough to necessitate their replacement temporarily or permanently. Eight per cent withdraw from service for unseen or unavoidable reasons, or are discharged for justifiable causes, and



EMPLOYEES' FIRST AID ROOM, EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



WOMEN EMPLOYES' DINING ROOM. A MEN'S DINING ROOM SIMILAR TO THIS IS ALSO PROVIDED. EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

about eight per cent in excess of actual need are usually kept on the payroll to take care of the normal fluctuation of production.

This leaves then approximately eighty per cent of the employees as the proportion which should be the permanent, steady working force of the average plant.

Applying the above percentages to the case of the twelve factories the deductions are as follows: 6,697 additional employees were required for increased production during the year and 13,843 persons would be the number required to make up for the loss of men by sickness, death, resignation and the other causes given above for vacancies that should be expected, making a total of 20,540 employees. Instead of engaging this number it was found necessary to hire 42,571 persons in order to keep the working force up to requirements, that is, over

twice as many employees were hired as it should have been necessary to hire.

The principal disadvantages resulting from the necessity of hiring so many more workmen than should be necessary are the lowering of the standards of the work produced, the bad effect upon the workman and his whole family in shifting about from place to place and the needless extra expense in manufacture. The first and second results are so apparent that they need no elaboration; but the third one of extra expense may be understood better by dividing it up into some of the leading items as given by Mr. Alexander.

These are the extra clerical work in the hiring processes, the instruction of new employees by foremen and assistants, the reduced rate of production caused by new workmen, and the increase of the amount of product damaged or spoiled by unfamiliarity with the work.



EMPLOYEES' LIBRARY, NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO.



THE NURSES OFFICE FOR EMPLOYEES, NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO.



SCENE AT HILLS AND DALES PARK. THE COUNTRY CLUB FOR EMPLOYEES OF THE
NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO.



FIELD DAY SPORTS AT HILLS AND DALES PARK. THE COUNTRY CLUB FOR THE EMPLOYEES OF THE NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO.

Very careful inquiry and study was made of the total of extra expense at the various plants incurred by the above causes, and the final calculation of the total loss of the twelve factories due to the turnover of labor was placed at \$831,000 for this one year. This is \$69,250 for each one if divided up equally; but the factories varied in size and number of employes, so that the amount of loss for some of them would be greatly in excess of the average amount.

Dr. Joseph H. Willits, of the University of Pennsylvania, Instructor in Industry, says in the *Annals of the American Academy of Political and Social Science*, concerning the turnover of labor at the present time, that "Speaking broadly, the average concern hires or fires as many people during the year as are on its payroll. This great flow of labor from shop to shop is a serious loss both to employer and employee. Esti-

mates of the cost to the employer of securing, hiring and adjusting the new employe to an organization range from \$30 to \$500 per individual."

Professor Roy Wilmarth Kelley, of Harvard University, in a discussion of labor turnover, gives the results which the Vocation Bureau of Boston found after investigating the experience of thirty different firms, employing 55,000 persons. This was that the cost of turnover of labor to these firms ranged from \$25 to \$100 per person. He also states that there is abundant proof to establish the fact that all large plants, unless they are actually diminishing their output and cutting down their force on that account, are now obliged to hire about twice as many employes during the year as are carried on their payrolls in order to keep the working force up to a constant number.

The following statements by Profes-

sor Kelley are also of interest in this connection: "The Federal Industrial Relations Committee reports that, in sixteen occupations of the cloak and suit industry of New York City, the maximum number of employes during any week of the year was only 1,952. The total number on the payrolls, however, was about 4,000.

"Reliable authorities have estimated that every year, in normal times, there are over 3,000,000 able-bodied men out of work for at least three months."

Mr. Boyd Fisher, vice-president of the Detroit Executives' Club, has contributed valuable information on the subject from the reports of the industries of his city. He states that the labor turnover in the last year in 57 Detroit plants has averaged a little over 252 per cent per plant and that plants which contain employment departments had a turnover one-third less than those which did not have such departments. He states that

"The employment department of the Packard Motor Car Company of Detroit estimates that the new and inexperienced workmen taken on as a result of labor turnover causes them to make a 25 per cent allowance of equipment for building, direct labor and supervision." He reports that the Saxon Motor Car Company has reduced its labor turnover 142 per cent, and that the Hayes Manufacturing Company has cut its turnover in two. He recognizes that the reduction of the turnover of labor is only the first step in what should be a development of the workmen and the elevation of their standards. In Detroit they are united and in earnest in their effort to reduce the excessive turnover of labor and are preparing to go, as he says, as far as the workmen's home life to solve this problem. He has found that labor turnover breeds inefficiency and inefficiency breeds turnover. He has already reported a long list of remedies which the



EMPLOYEES' DINING HALL, NATIONAL CASH REGISTER, DAYTON, OHIO.



THE BOYS' GARDENS ADJOINING THE WORKS OF THE NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO.

concern mentioned intend to apply to correct this serious defect in their industries.

Dr. E. M. Hopkins, president of Dartmouth College, says, "The one greatest problem in American industries at the present time is how to get and how to keep a labor supply who will do the work in hand in the best and most profitable way."

And so we find no end of authorities who are deeply impressed with the great importance of a concerted effort to diminish and bring down to a reasonable standard this excessive fluctuation of labor.

If the result of these experts secured in different localities were applied universally to the workmen of this country, the result secured would be most startling.

Mr. Alexander in his very valuable re-

port found that the cost to replace a workman was from \$8.50 to \$73.50 per man. The other experts vary in their reports as to the cost per man of labor fluctuation from \$25 to \$500. Even if we were to take the apparently conservative figure of \$50 per man and apply it to the 8,000,000 industrial workers of this country, assuming, according to Dr. Wilit's rule, that this number were hired and fired during the year, the total waste in this country thereby would be approximately \$400,000,000.

Few people probably realize the tremendous loss and waste that are occurring and might occur from this cause; and it is not alone the money loss to employer which ought to make the strongest appeal for a reform, but the fact that the shifting of workmen about and the idle periods ensuing lower the social standard, using up the savings of work-

men, throwing them into debt, causing their families to be broken up and sometimes resulting in sickness, disease, famine and crime.

The remedy for excessive labor turnover is unique compared with other industrial troubles, because it is something that cannot be accomplished by the enforcement of any set rules, as the employes always have the right to quit their jobs. Neither can the conditions which insure permanency of employment be secured by money alone. Adequate wages for a decent living with a reasonable surplus for old age are, of course, essential in every case; but the employe can usually secure the same wages at any one of the various plants engaged in the same business, and the greatest factor, therefore, in holding him permanently in his position is not his pay, but any one or several of the other conditions that surround his job. The remedy,

therefore, for labor fluctuation must, on account of the nature of the proposition, be something which will appeal to the workman and which he will voluntarily accept.

Practically, then, the problem reduces itself to discovering what will attract him, what will satisfy him and make him contented, not only with his work, but with his lot in life. The situation, when applied to the unskilled laborer, reminds one of the man who plays the bass drum in the band. He has the heaviest load to carry, and the least interesting instrument to play; but if he enjoys the music he will march along with the rest of them quite contentedly and happily, doing his part.

But, with the whole body of workmen, there is a feeling abroad that, prior to the war, they did not, as a rule, get their just share of the returns of their labor. Many feel that conditions were often



DENTAL DEPARTMENT FOR EMPLOYEES, NATIONAL CASH REGISTER COMPANY,
DAYTON, OHIO.

unnecessarily hard and severe, and now, since they were largely the means of winning the war and saving the world from ruination, they intend to see to it that they get some of the rewards in better working conditions.

So labor now has a bigger voice and a stronger control of affairs than it ever had before. But the heads of industry

do not plan to fight with labor. On the contrary, all that has been mapped out on the program of procedure has been of a peaceful nature; and if the measures planned and being discussed are carried into effect, they ought to put the American workman in a position better in every respect than he has ever enjoyed before.



THE BOYS OF THE NATIONAL CASH REGISTER COMPANY, DAYTON, OHIO, BEING INSTRUCTED TO MAKE FURNITURE OUT OF BOXES.

The OFFICE BUILDING of
GASTON, WILLIAMS & WIGMORE, INC.
ON LOWER BROADWAY, NEW YORK CITY
ALFRED C. BOSSOM, ARCHITECT

WHEN the war started Messrs. Gaston, Williams & Wigmore foresaw demands that the war was bound to create. They jumped in, in a typically American fashion, and grasped the situation with both hands, with the result that in less than five years from the date of organization, this firm has created a business that needed its own permanent and individual home on lower Broadway.

With the same enterprising spirit that this corporation displayed in building up a great activity, it decided its home should be the first building on Broadway with a façade of man-manufactured cast material.

The material for the building was cast in blocks by a special process and these were roughly finished at the place of manufacture in a manner very similar to that employed with granite. These were then taken to the site, erected, and the entire building was retooled and finished on the spot, just as the buildings are handled in Cuba.

The very unusual labor conditions prevailing at that time, due to the war, caused this, for the building would not normally have been handled in that way. It has, nevertheless, given to the structure an appearance that it is safe to state causes fully ninety per cent of the passersby to imagine it to be a granite building, although no effort was made to imitate granite. The material being intended to be exactly what it is—a cast concrete hand-worked, man-made product.

The general style of architecture is a free treatment of the Roman Classic and was adopted so as both to give the monumental appearance produced by great columns and yet to allow every available inch of light possible. The windows run to the ceiling and down to the floor. As

the site was so deep and the land so valuable, it was not desired to give up any more space than absolutely necessary for courts or internal natural lighting and ventilation.

The building extends through from Broadway to Trinity Place and occupies a site approximately 90 x 190. It has a central court and two longitudinal walls which divide it up into practically three separate buildings.

The ground floor is occupied by the entrance vestibule, etc., the Globe Steamship Company, one of the subsidiaries of Messrs. Gaston, Williams & Wigmore, Inc., the Philippine Bank and Hedsia Banking Co.

Access to the main executive offices on the second floor is gained by a very handsome monumental marble staircase eight feet wide, leading to a public hall on the second floor, from which open reception rooms and waiting rooms, that are surrounded by the private offices and directors' rooms of the corporation. All the executive offices are paneled in selected mahogany. Some of the members of the firm being experts on the subject, they insisted that their offices should be specimens of the finest cabinetmakers' handicraft.

Each of the other departments of the organization has been allowed quarters complete in itself and divided from all others by fire walls and fireproof doors.

Rest rooms and all other accommodations have been provided for both sexes throughout the building. The two passenger and one freight elevator provide service from all floors. The basement is given up to the equipment and the handling of a large tobacco activity in which the corporation is engaged.

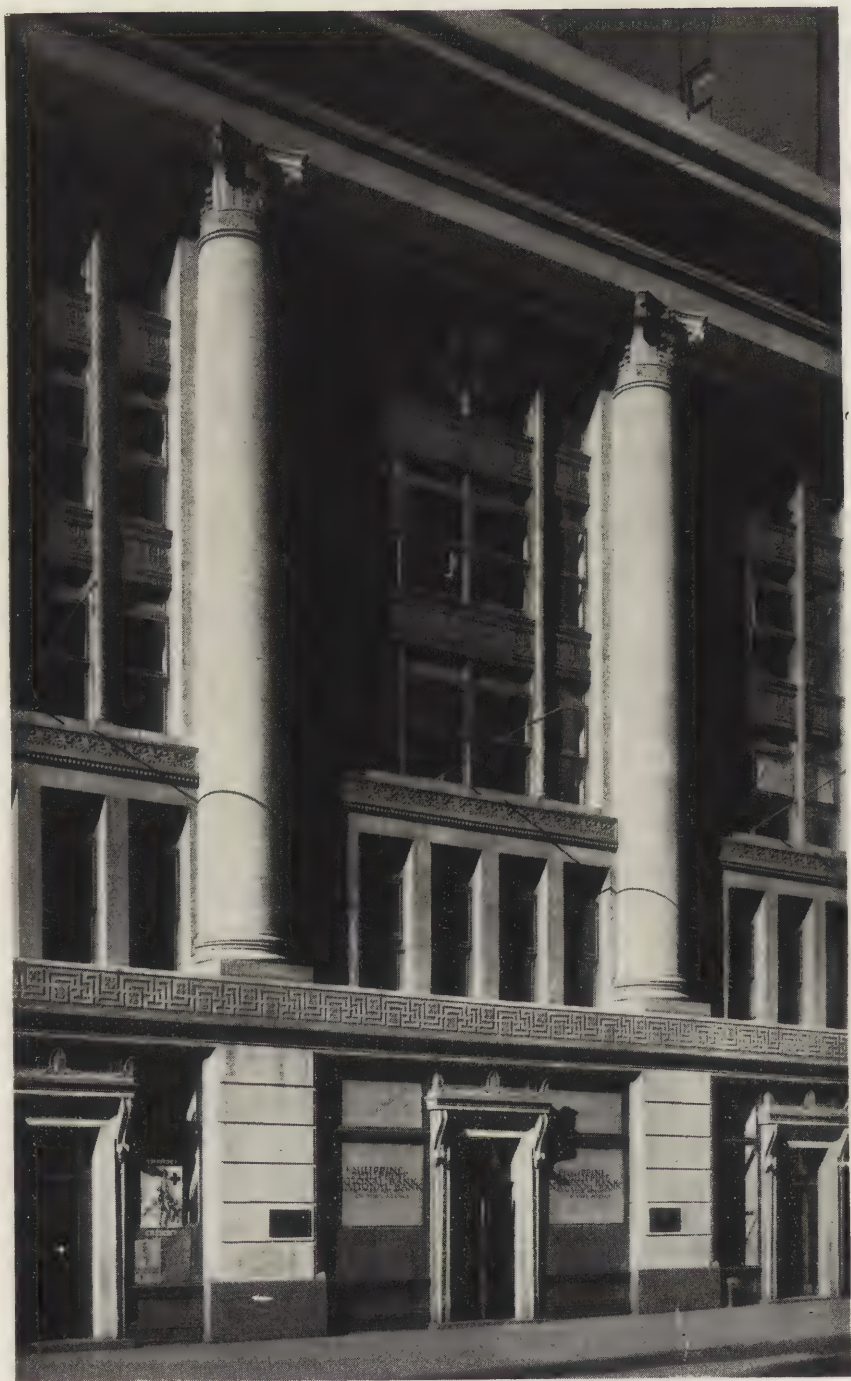
The use of concrete for other than manufacturing plants has so far not been



GENERAL VIEW OF FAÇADE, LOOKING UP
BROADWAY, GASTON, WILLIAMS & WIGMORE,
INC., BUILDING. ALFRED C. BOSSOM, ARCHITECT.



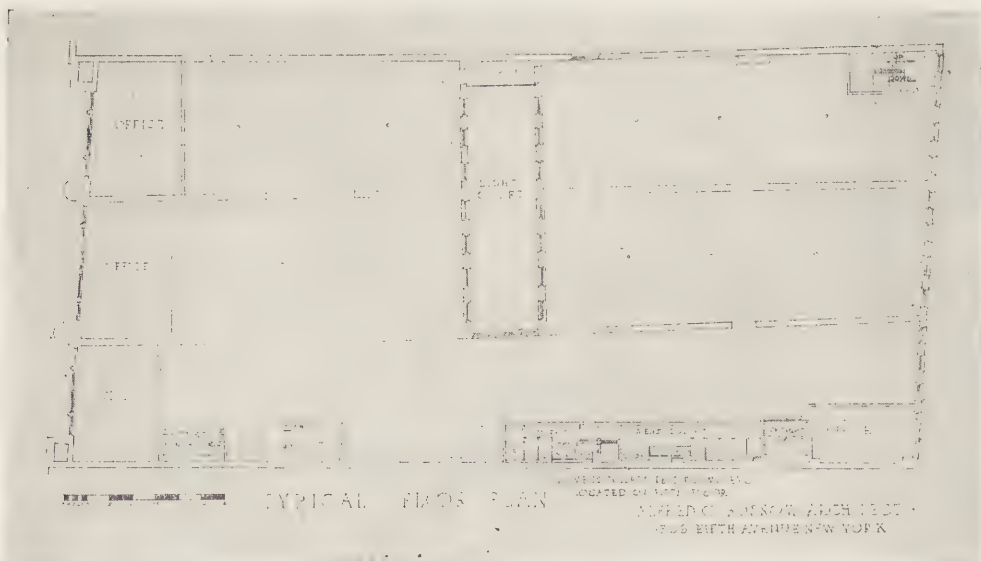
GASTON, WILLIAMS & WIGMORE, INC., BUILD-
ING ON LOWER BROADWAY, NEW YORK
CITY. ALFRED C. BOSSOM, ARCHITECT.



DETAIL OF CENTRAL BAY OF BROADWAY
ELEVATION, GASTON, WILLIAMS & WIGMORE,
INC., BUILDING. ALFRED C. BOSSOM, ARCHITECT.



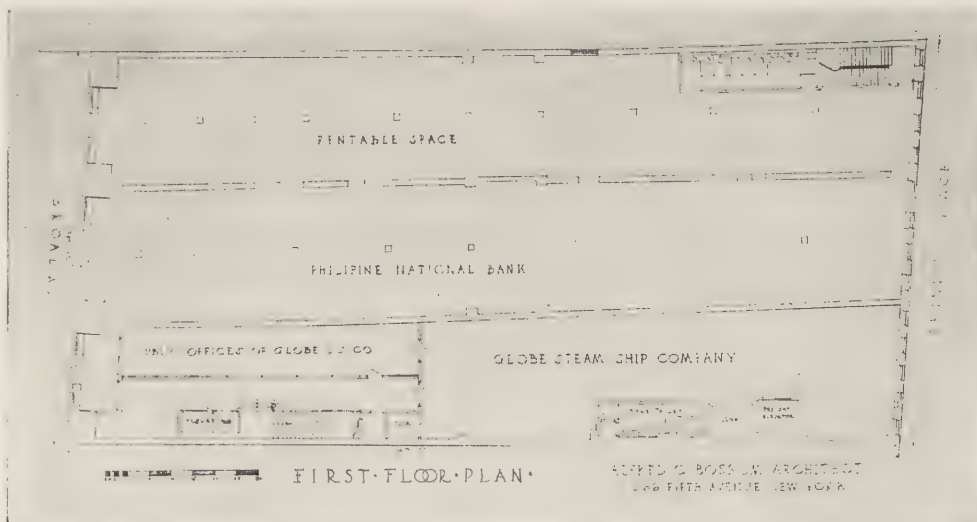
VICE-PRESIDENT AND GENERAL MANAGER'S OFFICE—GASTON, WILLIAMS & WIGMORE, INC., BUILDING.
Alfred C. Bossom, Architect.



GASTON, WILLIAMS & WIGMORE, INC., BUILDING ON LOWER BROADWAY, NEW YORK CITY.



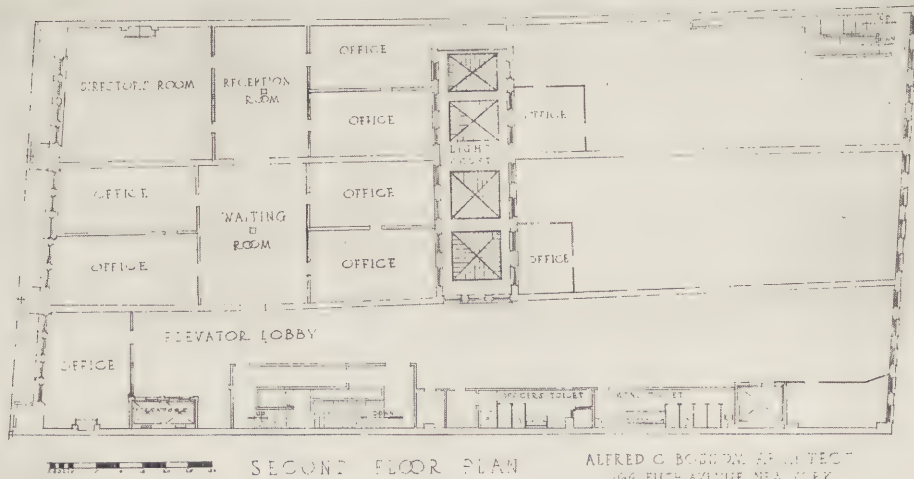
RECEPTION ROOM TO DIRECTORS' ROOM—SECOND FLOOR, GASTON, WILLIAMS & WIGMORE, INC., BUILDING.
Alfred C. Bossom, Architect.



GASTON, WILLIAMS & WIGMORE, INC., BUILDING ON LOWER BROADWAY, NEW YORK CITY.



DIRECTORS' ROOM—GASTON, WILLIAMS & WIGMORE, INC., BUILDING.
Alfred C. Bossom, Architect.



GASTON, WILLIAMS & WIGMORE, INC., BUILDING ON LOWER BROADWAY, NEW YORK CITY.



GASTON, WILLIAMS & WIGMORE, INC.,
BUILDING. ALFRED C. BOSSOM, ARCHITECT.



ENTRANCE HALL, GROUND FLOOR—GASTON, WILLIAMS & WIGMORE, INC., BUILDING.
Alfred C. Bossom, Architect.

very extensive; in fact, it is safe to state that it is only in its infancy. In former times there were a few concrete buildings built in Europe. Twenty years ago the engineers of France actively tried to introduce this material. They sent speakers to England, who lectured before the Royal Institute of British Architects and others, but their efforts were not crowned with much success, and it has been left to America to take the lead in creating examples such as this corporation's building provides, and will without doubt tend to a much wider use in the very near future.

There is one underlying principle about construction that is often lost sight of. The coefficient of expansion of practically every material used in building varies and the result is that as the temperature changes throughout the year, so there is

this continuous movement among all the different constituent parts of every construction. This leads at once to deterioration.

In reinforced concrete the coefficient of expansion is practically the same between the metal and the cement and stone, which puts it instantly at an advantage for durability over brick and a steel frame building for instance. It has its handicaps, of course. If the material is cast and left from the mold, the water naturally gravitates to the outer surface and forms a very thin crust of different specific gravity, which consequently is sure to craze, and in a very short time get unsightly; but by removing this exterior surface or crust, so that the exposed surface is of the same density as the body of the material, this disadvantage should be eliminated and leave a sur-

face sufficiently dense and waterproof, provided the correct ingredients have been employed in the manufacture of the material, that this concrete surface should withstand the action of the elements equally well, if not better, than the hardest material we use for exposed surfaces. That is—the granite.



ELEVATOR LOBBY, SECOND FLOOR—GASTON, WILLIAMS & WIGMORE, INC., BUILDING.
Alfred C. Bossom, Architect.



THE ESTHETICS OF ENGINEERING

Bibliographical Notes

By F. WEITENKAMF

The question, the problem, implied by the above title is with us, very much with us. The history of our skyscrapers, a history of slowly awakening realization of the necessity of adapting design to changed conditions of construction, shows that; or the erection of bridges with meaningless decoration of a "gingerbread," or rather wedding-cake-ornament, type. With the necessity of giving, in the design of a structure, outward expression of the inner construction, the importance of absolute harmony and understanding between architect and engineer is evident. Without any thought of reverting to conditions of the Italian Renaissance, and finding architect and engineer in one person (say Leonardo da Vinci or Michael Angelo), one may insist on discriminating co-operation between the two professions.

In view of the present-day widespread *cacoethes scribendi*, the printed matter relating to the present subject—at least as far as I have been able to unearth it—seems not too extensive. However, the following list, partly the result of personal examination of items, partly taken from sources such as the "Engineering Index" and the *Industrial Arts Index*, seems suggestive. I offer it in the hope that readers of

The Architectural Record may add to it, and that it may perhaps stimulate discussion and thought.

Engineering handbooks, such as DeWitt Clinton's "Engineering for Architects" (1916), or Joseph Kendall Freitag's *Architectural Engineering* (1912), have not been included. The earliest title that I have found which bears a certain relation to the subject is Henry Van Brunt's paper, before the American Institute of Architects, Dec. 7, 1859, on "Cast Iron in Decorative Architecture." It was reprinted in the *Crayon* for 1859.

The list follows:

Hofer, H. J. Artistic Engineering. *Engineering News*, 1877; pp. 134-137.

Statham, H. Heathcote. The Architectural Element in Engineering Works. *Journal of the Royal Institute of British Architects*, vol. 6, 3d series; London, 1899; pp. 385-396; Discussion, pp. 396-400.

In many cases "you cannot draw the line very easily between architecture and engineering." But beyond that there is an essential distinction; in one case consideration of architectural expression is important, in the other "consideration of structural fitness and economy of material are paramount." Artists are mournful over unbeautiful structures, but structure is in itself a subject of great interest. "A suspension bridge is so beauti-

ful an object that it is exceedingly difficult to spoil it." The discussion brought out the opinion that engineering should be under the control of the Institute of British Architects or of a Parliamentary Committee, and that "an engineer should seek the co-operation of an architect for his artistic details."

Wright, Frank Lloyd. The Art and Craft of the Machine. Journal of the Western Society of Engineers, vol. 6, 1901; pp. 354-369. Address, with discussion.

"It has too long been a matter of popular belief that the engineer and men of business are to create works and the artist to 'trim them up a bit.' The engineer designs his bridge, . . . turns it over to the architect, who hangs a few swags or garlands over its sides, builds a monument or two on it, without relation to the structure, . . . and during the process there has been neither sympathy nor intelligent co-operation between the engineer . . . and the architect, each feeling the other much in the way. . . . There is beginning here in the Middle West a movement to . . . seek earnestly for a normal regeneration." Author speaks of the "fearful slavery to precedent and tradition," in this "the machine age"; speaks of the tall office building as one representative problem, and notes that "the steel frame has been recognized as a legitimate basis for a sincere clothing of plastic material that idealizes its purpose without structural pretence."

Sewell, John Stephen. The Relation of the Architect and Engineer to the Design and Erection of Government Buildings. From a paper read at the convention of the American Institute of Architects. Engineering News, Dec. 18, 1902.

Bolton, Reginald Pelham. The Engineer, the Architect, and the General Construction Company. Engineering Magazine, August, 1904.

Purdy, Corydon T. The Relation of the Engineer and the Architect. Read at the convention of the American Institute of Architects. Engineering News, Jan. 26, 1905.

Franz, W. [Architectural Treatment of Engineering Structures.] Ingenieur-architekturen. Technik und Wirtschaft, June, 1910.

Parsons, William Barclay. The Architect and the Engineer, an address before the Architectural League, Feb. 8, 1911.

"Between the two branches of the profession there is a great gulf that as yet no engineer has been found capable of bridging, but . . . the difference should be recognized and clearly understood and the way opened by which the two groups can be made, not only to inspire each other, but to produce something greater and better in the way of construction than either group can possibly hope to obtain alone." Author says that "in spite of the common origin of the two professions there is no doubt that we have drifted far apart." Referring to mistaken views on both sides, and to the necessity of facing the combination of the science of construction and the art of construction, he concludes that the architect must "lay aside the rules that governed his predecessors centuries ago, and . . . take up fearlessly the science of the twentieth century."

Lux, Jos. Aug. Ingenieur-Aesthetik. München, 1910.

The chapters in this little book touch on engineering and style, iron as material of construction, the art of construction and the art of the engineer, the art of the engineer and the spoiling of landscape, reinforced concrete and its artistic possibilities, esthetics of machinery and the means of communication. "Artistic form," says the author, "must be newly invented from new elements. That is the problem at which we are all working." He cites Eiffel: "I firmly believe that my Eiffel tower will have its peculiar beauty. . . . The basis of all construction is that the general lines of a building shall completely correspond to its purpose. And what is the fundamental necessity in my tower? Its power of resistance to the wind."

Bernhard, Karl. Der Moderne Industriebau in Technischer und Ästhetischer Beziehung. Zeitschrift des Vereines Deutscher Ingenieure, vol. 56, 1912; pp. 1141, 1185, 1227.

Architect and Builder Not Synonymous. Architecture and Building, vol. 45, April, 1913; pp. 127-128.

Engineering Standards and Architectural Requirements. Engineering Record, vol. 68, Aug., 1913; p. 114.

Caffin, C. H. How to Study Architecture. New York, 1917.

P. 477: "Co-operation of the architect and the engineer . . . is one of the needs of the age. . . . For it is only a narrow view of utility that overlooks the utility of beauty." On p. 339 the author notes that "Renaissance architecture involved no new principles of construction. . . . The architect ceased to be pre-eminently the master-builder. He became a designer . . . on paper." This last fact obviously may well have its bearing on the present question.

Bragdon, Claude. Architecture and Democracy. New York, 1918.

"There is in general all too little understanding and a confusion of ideas and aims. To the average structural engineer the architectural designer is a mere milliner in stone. . . . To the designer, on the other hand, the engineer appears in the light of a subordinate to be used for the promotion of his own ends. As a result of this lack of sympathy and co-ordination, success crowns only those efforts in which, on the one hand, the stylist has been completely subordinated to engineering necessity, as in the case of the East River bridges, . . . or in which the structure is of the old-fashioned masonry sort, and faced with a familiar problem, the architect has found it easy to be frank; as in the case of the Manhattan Storage Warehouse or in the Bryan Park façade of the New York Library. The Woolworth Building is a notable example of the complete co-ordination between the structural framework and its envelope, and falls short of ideal success only in the employment of an archaic and alien ornamental language."

The specialty of bridges has received an extra share of attention, as witness these titles:

Johnson, J. B., Bryan, C. W., and Turneure, F. E. Theory and Practice of Modern Framed Structures. New York, 1893.

Chap. XXVI, on "The esthetic design of bridges," deals with the influence of material, color, shade and shadows, ornament, etc.

- Husband, Joseph. *The Esthetic Treatment of Bridge Structures*. . . . London, 1901. Reprint, Minutes of Proceedings of Institute of Civil Engineers, v., 145th session, pt. 3.
- The Esthetic Characteristics of European Bridges. Editorial, with the first of a series of views of notable bridges, selected by E. M. Wheelwright, who has made a study of his subject. *Engineering Record*, Feb. 2, 1901.
- Esthetics in Bridge Building. Remarks on the work of various nations, suggested by a paper read before the British Inst. of Civil Engineers. *Builder*, March 15, 1901.
- Ornamental Bridges. By H. G. Tyrrell, *American Architect*, Aug. 24, 1901.
- The Architectural Treatment of Bridges. Illustrated extracts from "The Builder," giving suggestions for designing piers and spandrel facings of flat masonry arches. *Engineering Record*, New York, Nov. 2, 1901.
- Some Modern Types of Swiss and German Bridges. *Scientific American*, Sup., May 23, 1903.
- Schmidkunz, Hans. *Zur Aesthetik der Verkehrsbauten*. *Architekt*, Wien, Jahrgang 10, 1904; pp. 41-44.
- Killam, Charles M. *Bridge Design from the Architect's Standpoint*. *Harvard Engineering Journal*, Nov., 1909.
- Young, C. R. *Esthetics in Bridge Design*. With discussion. 13 plates. *Canadian Society of Civil Engineers, Transactions*, Montreal, 1911; vol. 25; pp. 254-288.
- Tyrrell, Henry Grattan. *Artistic Bridge Design*. Chicago, 1912.
- Koester, Frank. *Bridges and Bridge Approaches*. *American City*, New York, 1913; vol. 8, pp. 467-472.
- Mayer, Max. *Die Brücke als Kunstwerk*. 10 plates. *Die Plastik*, München, 1914; pp. 25-28.
- Tyrrell, Henry Grattan. *The Esthetic Value of Municipal Bridges*. *Wisconsin Engineer*, 1914, vol. 18; pp. 253-259.
- Tyrrell, Henry Grattan. *A Plea for Beautiful Bridges*. *Association of Engineering Societies, Journal*, St. Louis, 1915, vol. 54; pp. 35-43.
- Klaber, John J. *Suggestions for the Artistic Treatment of Iron Bridges*. *American Architect*, 1915, vol. 107; pp. 357-360.
- Titus, W. J. *Artistic Design of Concrete Bridges*. In: *Hool, W. J. Reinforced Concrete Construction*. New York, 1916, vol. 3; pp. 493-527.
- Waddell, J. A. L. *Bridge Engineering*. New York, 1916; vol. 2, chapter 52; pp. 1150-1181; *Esthetics in Design*.
- Waddell, J. A. L. *Esthetics of Bridge Design*. *Railway Review*, vol. 62, 1918; pp. 710-714.
- Fowler, Charles Evan. *Architecture and Construction of Bridges*. *N. Y. Railroad Club Proceedings*, vol. 28, Sept. 20, 1918, pp. 5385-5395. General discussion, pp. 5394-5395.

Evidently, the matter of influence of material is a very important one here, as in any art. (Among a number of books and other writings of this phase of the subject of architecture, one at least—Banister F. Fletcher's "Influence of Material on Architecture" [London, 1897]—has a chapter [ix] on "Modern Architecture: a Mixed Period, the Age of Iron and Steel.")

In any art, the artist must understand the materials and tools with which he works. He must recognize and respect their limits, and appreciate and utilize their possibilities. That's why the sculptor adapts his clay model to the material (granite, marble, bronze) in which the statue is to be reproduced eventually. That's why woods of different degrees of hardness produced changes in wood-carving design in English furniture. Can architecture get away from this universal rule?

These matters of structure and material are basic, of course, as appears sufficiently clearly from even the short summaries above given of some of the writings listed. It is the misapplication of certain ideals in design to structures to which they were not suited that may have helped to retard a better understanding of present-day problems in the proper outer presentation of engineering structures. The architect, it would seem, has already lost the game if he tackles his job as one which implies covering up by a beautiful shell a structure that is ugly. It is only by discovering whatever there is of dignity and beauty in an engineering structure, and insisting on its salient and structural characteristics, that the finest success has been or can be achieved.

One thinks here of the always pleasing old East River Bridge, New York, in its simple, straightforward presentation of the technical problem before the engineer. Or of the Woolworth Building, also in New York, which finds its success not because of its Gothic character *per se*, but because it accentuates those perpendicular lines of steel-structural strength which most sky-

scraper architects had fearfully tried to suppress by the emphasis of horizontals.

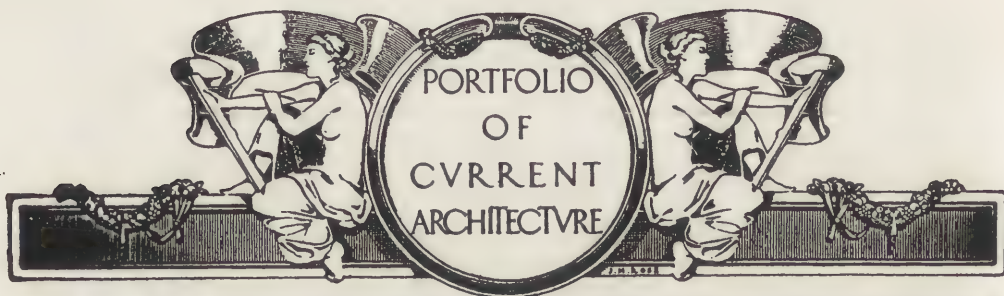
Of course, no depreciation of the value of traditions is intended. One must note with regret the present-day disregard of the work of the past, the disinclination, in the broad field of the applied and decorative arts, to look at anything older than yesterday or this morning, the frequent wild hunt for the new. It is only the forcing of designs, no matter how approvedly classic, in violation of the eternal law of appropriateness, that is to be deprecated.

Art is an expression of the racial and social atmosphere of its time and its surroundings. The expression of taste may

change, but not its underlying principles. Is it not, after all, adjustment of means to end and end to means that makes the beauty and impressiveness of the Greek temple, the Gothic cathedral, the Renaissance villa, the Colonial country house? And does not the same rule hold good today?

Changed conditions force readjustment in any line of activity. International political affairs have been, and are, emphatically teaching us that. The extracts from the writings cited above seem to show clearly the need for a full understanding in the question of the architect *and* (not *vs.*) the engineer. Perhaps the publication of this list may help a little in that direction.





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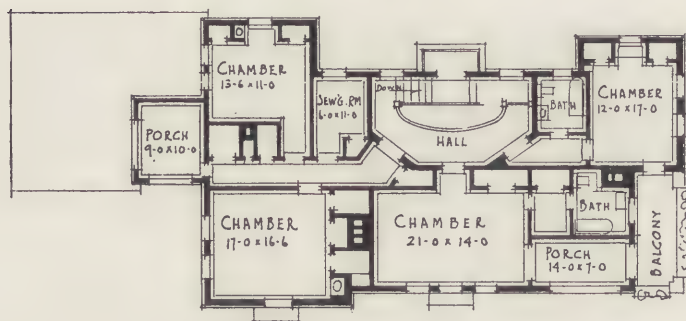
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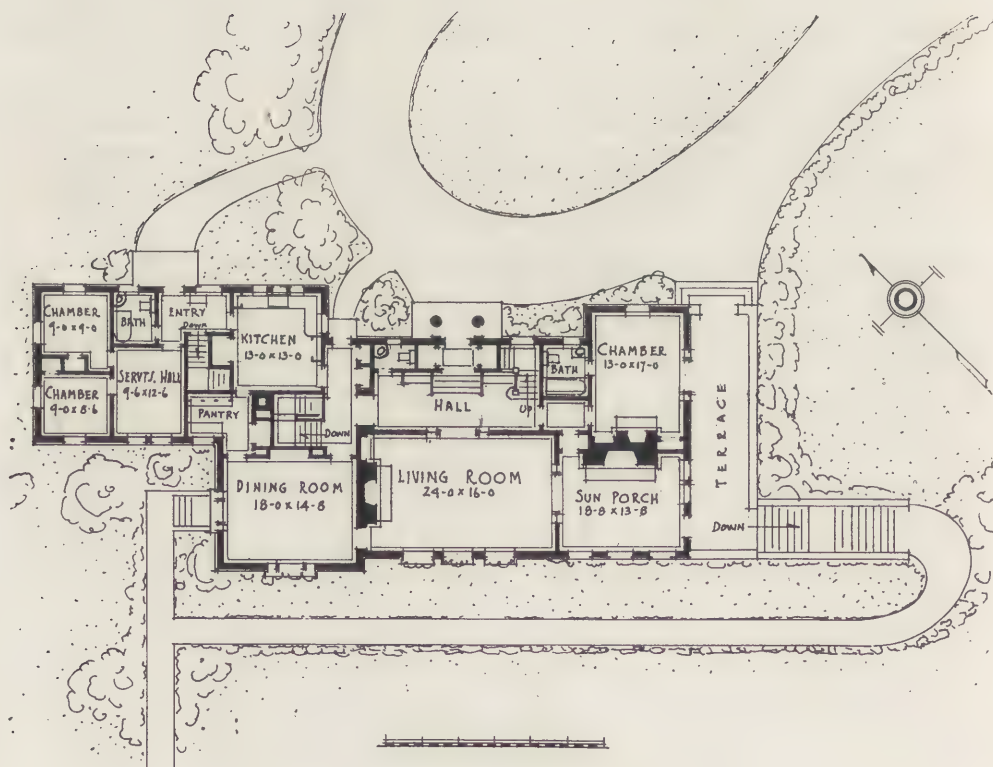
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**The River
of
San Antonio.**

Few municipalities recognize the possibilities for civic improvement which are to be found in even a small stream of water. Fewer still develop these possibilities when they are recognized

Occasionally there is a city, however, in

which a stream is appreciated and is regarded as something more than part of a drainage system. Among these may be recorded the name of San Antonio, Texas. To be sure the stream which San Antonians dignify as a river would be referred to as a creek or brook in a more humid climate, but streams of any size or variety are not sufficiently common in the great Southwest to be trifled with. Even so, the majority of cities would fail to recognize the desirability even of a little stream writhing erratically through the downtown district and withholding from commercial use many acres of valuable real estate; the average City Council would have built an intercepting sewer, the stream would have disappeared from view and the city would have become as commonplace as any other good hustling enterprising town.

San Antonio saw further and, tiny and lacking in moisture though her river might be, she decided to make the most of it. She neither condemned it to solitary confinement in a brick sewer nor straightened



THE SAN ANTONIO RIVER, SAN ANTONIO, TEXAS.

"Trees form archways above its course."



THE SAN ANTONIO RIVER, SAN ANTONIO, TEXAS.

"Flowers here and there brighten it up."

its course. Instead she wisely let it follow its own sweet way, gave it a wider bed than it demanded, and then made of this bed an attractive little parkway contentedly following the stream's windings and insinuating itself into the most unexpected corners of the downtown district.

Miles of the river still remain undeveloped within the city limits, but in the business center the greatest care has been taken to enhance its attractiveness. No attempt has been made to produce elaborate effects; its banks have been simply grassed over; trees form archways above its course, and flowers here and there brighten it up and add a touch of charm and color, although with but little more of sophistication than nature would employ.

Winding about as it does, it passes under a myriad of bridges, each bridge affording the passerby delightful vistas of fresh, green foliage and quiet waters, a welcome relief from the torrid heat and scorching sun of southern summer days.

I. T. FRARY.



THE SAN ANTONIO RIVER, SAN ANTONIO, TEXAS.

"Delightful vistas."

**Passing of
the Lock Haven
Bridge.**

It is always with a feeling as of a personal loss that we note the passing of an old landmark. In a recent number of the Record photographs were shown of the old covered wooden bridge at Lock Haven, Pennsylvania, and gratification was expressed that so fine an example of these rapidly disappearing structures had thus far survived the menace of fire, flood and "modern improvement."

It is with regret that we learn that the first of these destroying agencies has at last made of it a victim. During the night of January 27th, fire was discovered eating its way through the old dry timbers and in a few hours the picturesque structure was in ruins.

There is but little doubt as to the in-



THE SAN ANTONIO RIVER, SAN ANTONIO, TEXAS.

"An attractive little parkway."

cendary origin of the fire, as it was reported that it apparently started simultaneously in several places and spectators claim to have detected the odor of oil or gasoline.

Inasmuch as the bridge was 800 feet in length, it was impossible to cope with the flames, which soon spanned the river with a most spectacular curtain of fire. Within a few hours nothing was left but the stone piers, and another reminder of the days of heavy timber construction had become but a memory.

I. T. FRARY.

Picturesque Towns of the Border Land.

For the architect with an appreciation of the picturesque and a fondness for the use of pencil and camera, there is available a rich and almost unknown field in our great Southwest.

The old Missions of California are of course well known, as are those of San Antonio though in a less degree; but the little towns and villages along the Mexican border, apparently sleeping under the spell of ancient Spain, are practically forgotten. Yet here are to be found quaint old stone houses and churches, picturesque streets and bits of architectural detail that transport one in imagination to the Old World and make it difficult to realize that one is actually within the confines of his own land.

These border towns trace their history back in many instances to the days of the early Spanish settlements, and the inhabitants today are almost exclusively of Mexican origin, speak the language of Mexico, and to a large extent preserve its customs and traditions. So isolated are



SAN YGNACIO, TEXAS.

"Writhing posts to support the roof of his *porte-cochère*."



SAN YGNACIO, TEXAS.

"Beautiful window grilles or rejas."



SAN YGNACIO, TEXAS.

"Quaint old stone houses."

they that they have scarcely felt the throb of modern life, and one who can appreciate and enjoy the charm of their simplicity will be well repaid for the effort involved in seeking this out-of-the-way land.

These towns are in many cases remote from railroads and can be reached only by lonely roads of dubious quality which lead through limitless wastes of mesquite, chaparral and cactus. Desolate as the country is and apparently uninhabited, save for an occasional deer, coyote, or rat-



SAN YGNACIO, TEXAS.
"Picturesque streets."

tlesnake, there will be found at infrequent intervals quaint villages, poverty stricken and lonely, yet possessing a charm that is emphasized by the unexpected bits of picturesque architecture and interesting detail that betray the Spanish origin of the early settlers.

The houses are built mostly of stone, plastered over and whitewashed, and against their white walls are contrasted the painted doors and window casings, which are invariably a bright blue in color, this being a hue which is apparently most acceptable to the Mexican sense of beauty.

The houses are as a whole, like those of Southern European villages, bare and plain, except for an occasional touch of ornament about the doors and windows, and with here and there an example whose walls are enriched with ornamental stucco, or upon which the Spanish love of wrought iron work is evidenced in beautiful window grilles.

These grilles or rejas, which are common on Spanish houses, serve as trysting places where the young men may woo the señoritas, it being a custom that the young people can converse with each other before marriage only through the grated windows. The grille illustrated here was found in the little village of San Ygnacio, a town of but a few hundred inhabitants located



SAN YGNACIO, TEXAS.
The old fort.



SAN YGNACIO, TEXAS.
"Wattled walls and thatched roofs."



SAN YGNACIO, TEXAS.
 "A brave showing in paneling."

fifty miles from a railroad on the bank of the Rio Grande. The photograph was taken just before Christmas, and an old barn lantern can be seen hanging behind the grille, it being customary to keep a light burning in front of the house at Christmas time in commemoration of the Star of Bethlehem.

Examples of these wrought iron grilles are to be seen in another house in this same little village, and on this house, which is the most ornate in town, the walls make a brave showing of paneling executed in stucco laid over the rough stonework. It is most surprising to find such excellent examples of wrought iron work in these remote communities, and the first thought naturally would be that they were brought from Spain by some of the early settlers, but inquiry elicited the information that these particular specimens were hammered out upon the anvil in the local blacksmith shop.

The old Fort of San Ygnacio is now used as a private dwelling, but the loop holes are still to be seen in the walls and the row of gargoyles which carry the infrequent rains from its roof give to its exterior an interesting touch.

The houses of stone and stucco belong to the well-to-do. Those whose means are

unequal to the demands of these enduring materials content themselves with wattled walls and thatched roofs, many of which, as the illustrations show, are most interesting in effect. Just why the builder of the double house, which is shown here, chose the extraordinary writhing posts to support the roof of his "porte-cochère" is beyond one's ken, though the guess might be hazarded that he was an admirer of the twisted columns of the Italian and Spanish Renaissance.

A wealth of romance lingers about these little forgotten towns and the occasional artist or author who penetrates this border land is well repaid for the trouble and discomfort involved in searching it out.

There is little enough of the old time, old world atmosphere left in our country and when found it is usually accompanied by the modern addition of bill boards, pop corn, peanuts and guides. Here, however, one can detach himself from the stress of today and in the vastness of the mesquite plains and the quiet of the sleepy towns can enjoy undisturbed the simple charm that the early Spanish padres bequeathed to the land which they undertook to civilize two centuries and more ago.

I. T. FRARY.

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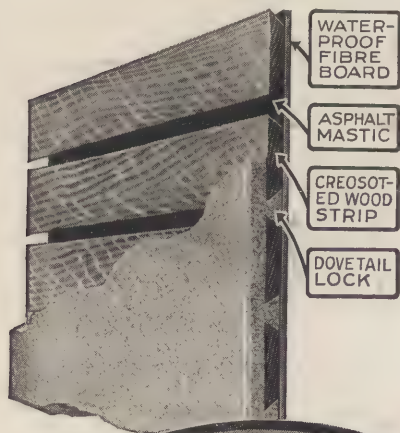


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RESIDENCE OF LEONARD M. THOMAS, ESQ., NEW
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The CITY RESIDENCE *of* LEONARD M. THOMAS, Esq. NEW YORK CITY



FRANCIS BURRALL HOFFMAN, JR. ARCHITECT

By Charles Over Cornelius

THE natural development of aesthetic appreciation is from the simple to the complex. The first rudely scratched drawings on bone, created without any thought of conscious beauty, were truly the beginning of the complicated art of the later centuries when appreciation for the creations of the artist called into play the practised use of the several senses. The growth of this aesthetic appreciation has paralleled, although not at all times synchronized with, the increasing complexity of the social and economic development of the nations, so that it is but natural, with the involved social and economic life of today, that we should have an equally involved appreciation of works of art.

The city residence of Leonard M. Thomas, Esq., F. Burrall Hoffman, Jr., architect, affords an excellent example of the varied yet consonant appeal which beauty in many forms can make in a century in which subtlety has taken the place of the naïveté that has fled. Devoid of any archaeological bias, this house makes its greatest appeal through the unadulterated beauty of the past, and yet with its ineradicable stamp of modernity it is the very essence of the twentieth century.

Perhaps the most striking feature in the consideration of the house is the restraint with which the architect has handled his problem and material. It is the restraint prompted by love for beauty in large effects and an instinctive sense of values which are chiefly found within the world of music—the restraint which will allow a great symphony orchestra to accompany a great pianist or a great pianist to accompany a great violinist, each considering primarily the interpretation of a composition which both admire.

In the composition of the street façade

of the Thomas residence the usual architectural impedimenta of mouldings and quoins are discarded. The scale is set by the nice relation between the window openings and the wall surfaces surrounding them. The texture of this wall contributes not a little to its air of animate repose and the material is used in its simplest form. The finest part of the decoration is the group of window grilles of the first floor, whose shadows pattern the plastered wall. The brick and stone work below the line of these windows lacks relation to the rest of the elevation, is somewhat spotty and trivial and fails to carry the breadth of treatment down to the ground. The ironwork of the fence, beautiful in itself, is lost in its proximity to that of the windows.

The plan of the house, the result of remodeling two older houses, is simple in its main features, and can be grasped easily from the accompanying illustrations. The street door opens on the axis of the long corridor which leads back, bounding one side of the patio, to the great living-room at the rear. The dining-room forms the third side of the patio opposite the living-room and a high wall encloses it on the fourth. The library is above the dining-room and its oriel overhangs the patio. There is a small entrance hall from which the stairs ascend, but it plays little part in the effectiveness of the arrangement.

The library, one flight up, is paneled in dark oak and ceiled in warm-toned plaster. The subdued light, the rich colors of the bindings and the arrangement of the furniture contribute to give it the air of quiet and intimacy which its use demands. The Gothic mantelpiece is carved in a warm tawny stone, approaching in places the deepest tones of old ivory; and the robust Goya, which hangs on the opposite wall, exerts



LIBRARY—RESIDENCE OF LEONARD M. THOMAS, ESQ., NEW
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WEST END OF LIVING ROOM—RESIDENCE OF
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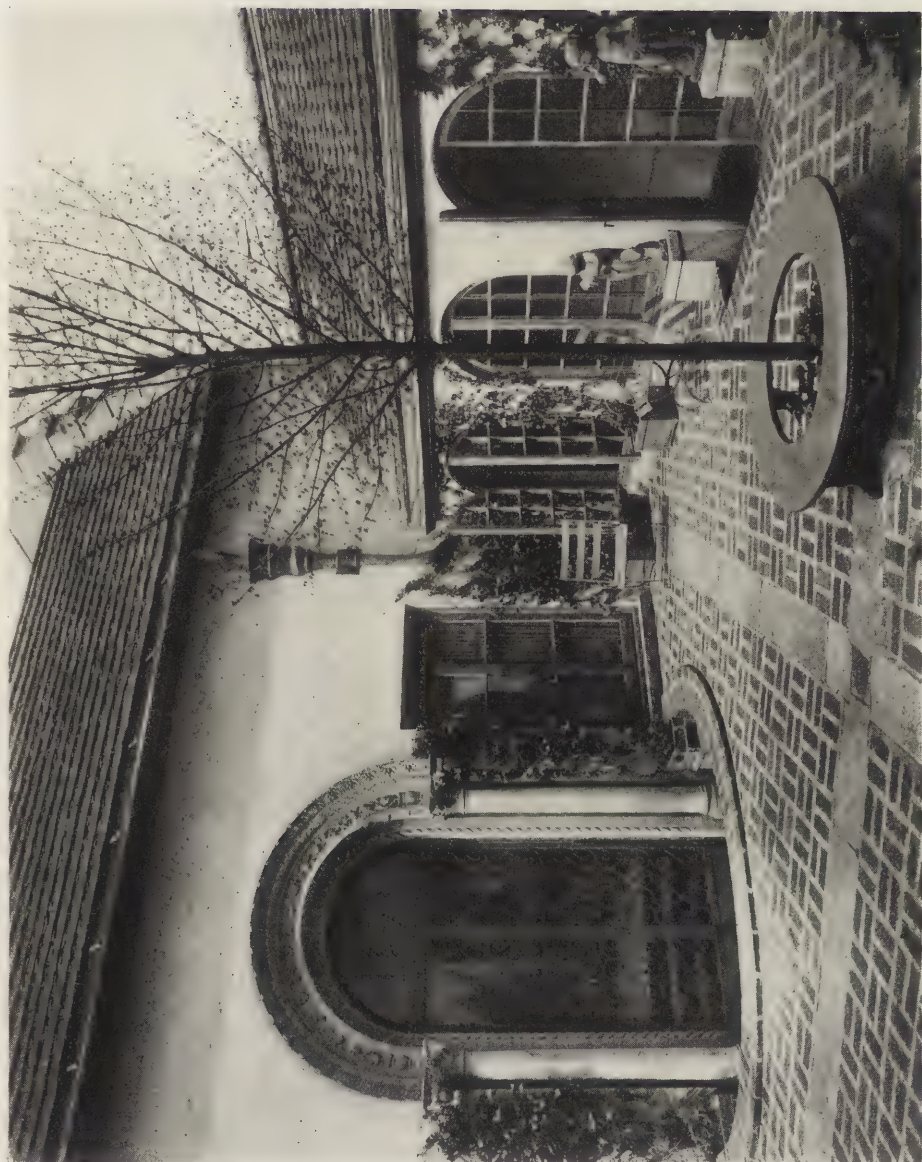
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CORRIDOR LOOKING TOWARD ENTRANCE—RESIDENCE OF LEONARD M. THOMAS, ESQ., NEW YORK CITY. F. BURRALL HOFFMAN, JR., ARCHITECT.



CORRIDOR LOOKING TOWARD LIVING ROOM—RESIDENCE OF LEONARD M. THOMAS, ESQ., NEW YORK CITY. F. BURRALL HOFFMAN, JR., ARCHITECT.



PATIO—RESIDENCE OF LEONARD M. THOMAS, ESQ., NEW
YORK CITY. F. BURRALL HOFFMAN, JR., ARCHITECT.

an almost hypnotic attraction increased by the perfection of its setting. Less dependence has been thrown upon upholsteries in this room than is usually the case, the rich color of the old wood giving warmth and light reflected from the wide boards of the flooring and the uncovered chairs, bench and tables; while such textiles as are introduced have been chosen for their colors subdued by time and the added richness and comfort which they supply. The stained glass in the windows gives more color of a different quality which plays in upon the rich woodwork.

Below this room, and practically twice its size, is the dining room, whose keynote is struck by the series of eighteenth century Venetian paintings which fill the wall spaces. The ceiling is made up of small panels of typical eighteenth century Venetian decoration, whose neutral tones form no distraction from the stronger notes of the walls and painted furniture. The panels of Venetian scenes have the softened beauty which the hand of time and the many glazes, whose use the Venetians knew so well, give to the brilliant colors. The large panel over the sideboard affords us a glimpse into the heart of Venice, the Piazza of St. Mark on a fête night. The myriad human figures, the strange beasts and the distant Cathedral are all seen by the glow from lighted windows and up-raised torches. The light in the room itself is so arranged as to heighten dramatically this effect and to add mystery to the canal vistas in the smaller panels.

The living room at the opposite side of the patio is the most important room in its dramatic effect. It is a separate small building, to which the corridor leads from the main house, and whose air of detachment lends it a particular distinction. Exquisite quattrocento bracket capitals support the semi-circular wall arches which intersect the vaulted ceiling, whose surface, like the wall, is finished in suave, creamy plaster flushed with orange. The fireplace is a deep grey pietra serena, lightened in places by a silvery patina. The colors in the room give it much of its unusual character,

the predominance of a soft faded green brocatille shot with golden silk for the upholstery and the use of a luscious orange, in certain lights toning to apricot, for cushions and piano cover. Old yellow brocade on the chairs and settee at either end give subtle support to the yellows in the brocade of couch and table covers; while the orange is re-echoed in the vestments on the wall beneath the high splayed window and the vibrant orange of the thin silken window curtains made up of two thicknesses of silk, one yellow and one rose. While this yellow-green and orange form the strongest accents, there is yet an under current of soft reds, blues and greens in the tapestries, rugs and incidental upholstery to give body and bass to the color composition. The wrought iron flower stand, with its orange tree, heavy with fruit, is the crowning touch of artistry, translating into terms of nature the artificial colors of the velvets.

In this spacious apartment it is that the subtle appeal of the house centers. Its various furnishings speak through their beauty of color and line or the by-paths of pleasant historical association which they suggest, a voice to which time has added poignancy, and "all this array is really less like a new thing than the last surviving result of all the more light-some adornments of past times." Yet from their arrangement and grouping, from the juxtapositions dictated by comfort and use, there is created a definite atmosphere of modernity which makes the ensemble eminently suitable as the background for the movement of modern social life.

The dramatic effect of the house is not the least of its merits, an effect gained by the variance in floor levels, by contrast in the character of the several rooms and by delightful glimpses from windows into the patio. The living room wall of this patio is of particular merit and is chiefly a setting for the Italian doorway of weatherworn marble. The great iron bracket lantern high on the opposite wall lights the patio and at night throws an eerie light through the iron scroll work of the gates, mingling with the colors

of the stained glass in the oriel which glow in the darkness.

The main apartments of the house centering around the patio follow an ancient precedent which has never been bettered; and the combined result of imaginative architectural thought and discriminating decorative sense has resulted in a house of rare distinction and beauty,

whose livable quality has in no wise been lessened by an observance of the best convention and in which a majority of the seven arts unite, each in its proper relation through beauty of color or line, dramatic quality and harmony of tone, to produce an indefinable atmosphere of richness and dignity.



BOUDOIR—RESIDENCE OF LEONARD M. THOMAS, ESQ.,
NEW YORK CITY.

F. Burrall Hoffman, Jr., Architect.

BUILDING AND THE COST OF CONSTRUCTION



By

Michael A. Mikkelsen



The increase in the cost of construction varies greatly according to the type of project contemplated, for the advance in prices of materials and in wages has not been uniform. The advance has been most conspicuous in the metal products group of materials — structural steel, heating and plumbing supplies, etc. The index number for construction materials, including steel, has advanced 89% since 1913; excluding steel, the advance is 84%.

As regards wages, the principal advance has been for common labor. Basing calculations not on actual earnings, which include overtime and other variable factors, but on union wage scales, the index number for wages in the building industry in 41 leading cities has advanced only 28.5% since 1914.

The result is that the cost of construction has gone up somewhat more than 80% for, say, a high grade steel skeleton office building and somewhat less than 50% for dwelling houses and other buildings in which the metals group of materials is not so largely represented.

However, the cost of construction even of a high grade steel office building has not advanced on a par with commodity prices; the Bureau of Labor Statistics index number for which, registered an advance of 106% in November, 1918, and of 97% in February, 1919 (Dun's March number is slightly higher than the February, the Bureau of Labor statistics number for March not being yet published), compared with the year 1913.

What is the prospect for a reduction

in the cost of construction? A study of the general price level with an analysis of causes which raised this level and of the causes which may lower it will throw some light on this question.

The causes of the great rise in prices may be briefly analysed as follows:

1. An abnormal demand for commodities by the governments at war.

2. Scarcity of certain commodities.

3. Increased purchasing power of the governments of the belligerent countries, acquired by the sale of bonds and issue of paper currency which increased the total purchasing power of the countries out of proportion to the quantity of commodities available.

The governments could purchase commodities without limit as to price, and the chief consideration of the governments in regard to prices was that the price offered to manufacturers should be high enough to draw forth the goods required. Manufacturers of war materials being able to obtain abnormally high prices, competed with one another for labor and materials, forcing up the price level. Manufacturers of non-war materials, for which no abnormal demand existed, were obliged to compete with war industries for labor and materials, thus greatly increasing their costs of production and forcing a rise in prices of their products. In general, the price of war commodities was forced up primarily by the abnormal demand and the price of non-war commodities by abnormal costs.

Present prices of commodities pro-

duced by any business cover the costs of doing business and profits, which may be itemized as follows: Interest on borrowed money; wages and salaries; materials used; taxes; a fair return on the capital and labor of the owner, and excess profits.

Present prices cannot fall unless present costs decrease or business men, including farmers, are willing, or are compelled, to forego their profits. What is the prospect of a decline in the costs and profits enumerated above?

INTEREST ON BORROWED MONEY.

The interest rate has advanced on account of the war, and has, therefore, played a part in higher cost of production, although a minor part. There is no prospect of any substantial decline in interest rates and still less prospect of any appreciable reduction in the total cost of production from this source.

WAGES AND SALARIES.

The war has brought about a permanent improvement in the standard of living of wage workers in the United States. In the interest of war production, the Government assumed control over labor as well as over materials, credit and transportation. Having assumed such control, it was obliged to standardize, as far as possible, the conditions of employment. The eight-hour work day was proclaimed as the basic work day for industry. Furthermore, the principle was laid down that every workman was entitled, at the minimum, to a "living wage" and to sanitary working and living quarters. Through the Government's war control over industrial labor, and the consequent impetus toward a higher minimum standard of living, the cost of industrial production has been increased.

The Government, in one sense, did not introduce a new standard. It merely enforced an accepted American standard already in existence and on a large scale eliminated violations of it which had been common before the war, when immigrant labor was plentiful.

The position of labor has been per-

manently strengthened in this country, by the virtual absence of immigration for four years, during which period about 9,000,000 men of military age have been destroyed, largely in the countries from which our immigrants come. Just now, about 700,000 men are unemployed in the United States. While this is a large number in comparison with a year ago, the fact is that 1,000,000 men were generally employed in the pre-war days.

Wages are perhaps the largest item in the cost of production, and although wages have risen, union wage scales have not, generally speaking, risen above the cost of living. If we examine the cost of living budgets since November, 1918, we find that the only notable decline which has occurred is in the case of clothing. However, the saving in the budget there is offset by increased rents. Food at retail, which constitutes the largest item in the budget, has not materially changed. In other words, the cost of living to the workman has not declined and shows no immediate prospect of declining.

There are two good reasons for not expecting a fall in wages until the cost of living is reduced. First, employers generally are not desirous of forcing down wages until prices drop; second, wage earners will oppose any reduction and are in a strong position to make their opposition effective.

RAW MATERIALS.

The raw materials of one industry may be the finished products of another. Hence, the analysis at this point is difficult. It may be maintained, however, that the cost of raw materials of any particular industry, including agriculture, will not decline until the costs of production or profits of other industries have declined. Hence, generally speaking, any decline in the cost of raw materials must be the result of a decline in interest, wages, profits or taxes.

TAXES.

Taxes may be subdivided for our purpose into excess profits and income taxes

and other taxes. No substantial decline in taxes may be expected in the next few years except that as profits or income of any business decline, its taxes likewise will decline. Even if Federal taxation should decrease materially, it is altogether likely that this decrease will be offset by an increase in state and local taxation. Hence, no considerable reduction in the cost of production is to be expected as a result of decreasing taxation.

A FAIR RETURN ON THE CAPITAL AND LABOR OF THE OWNER.

It is not to be expected that, in the future, business men generally will be content or be compelled to accept less than a fair return on their capital invested and their labor applied. There will, of course, be some exceptions. In view of the strong expectation entertained in many quarters that food products will decrease in price, it should not be forgotten that a large part of the cost of production of farm products consists of the cost of labor of the farmer and his help, heretofore very inadequately paid. During the war the farmer has really obtained fair wages for his labor and will not easily be compelled to take less in the future.

EXCESS PROFITS.

Excess profits will no doubt diminish and some decrease in prices will result. Some industries during the war enjoyed huge profits and cannot hope to continue selling their products at war prices. Competition or Government interference would bring down their profits even if no immediate voluntary reduction is made. The copper, iron and steel industries have made substantial voluntary reduction. Other industries will doubtless follow suit, but excess profits are by no means a general condition in all industries, particularly not in many industries producing building materials. It should be added here that a large part of what many consider excess profits of farmers is only a fair wage for farm labor as pointed out in the preceding

paragraph and no great drop in farm prices of food stuffs can be expected for this reason.

Part of the effect of the decreased prices established by business men, by means of foregoing further excess profits will be lost by the consequent decline in Federal revenue from excess profits taxes. This decline in revenue will have to be made good by heavier taxes of other kinds which will tend to increase the cost of production.

NO MARKED DECLINE TO BE EXPECTED.

In brief, we must conclude from the foregoing analysis that prices will not fall materially—practically not at all except as the result of a decline in excess profits. In so far as prices of certain articles, such as iron, steel and copper, have decreased by removal of excess profits as an item in their composition, the price of certain other commodities into which these articles enter as raw material will fall. This, in turn, will affect the cost of living, and, in a round-about way, possibly wages. Without attempting to trace all the repercussions of such a sacrifice of excess profits, one may say the final results will not be marked, since the cause is relatively not very important.

INCREASED EFFICIENCY AND PRICES.

In the foregoing discussion, one important point which might be expected to reduce prices has not been touched upon. That is increased efficiency of labor and capital. Wages per day or week may remain the same and cost of labor decrease if labor is made more productive, whether by training of the workers, by proper provision for their health, by giving them an incentive to increase production by proper treatment, or by better organization of the plant. There is every reason to believe that in all these ways labor in the next few years will be made much more effective than ever before. Will prices, therefore, not decline for this reason alone even if no reduction occurs for any other reason? Not necessarily.

It is not to be assumed that increased efficiency of labor will mean reduced cost of labor. Labor will doubtless demand, and probably receive, even higher daily wages in the next few years than at present. It is easy to argue that labor should be content with the present money earnings and let any increase in efficiency go toward cutting down cost of production, which, in turn, will reduce the cost of living, and this, in effect, will amount to a rise in wages. But labor will see no plausible reason for accepting this roundabout and uncertain method of increasing its real income instead of driving at the more direct and immediate method of higher money wages for increased output. Of course, to obtain this increase, labor must be in a strong position and have a voice in industrial management; but labor will be in a strong position to demand a voice in industrial management, since democracy has been too much talked about during the war to be easily forgotten in times of peace.

THE NEW PRICE LEVEL.

But it may be asked, will not the increased volume of production upset the present price equation by increasing the quantity of commodities out of proportion to the volume of money and credit? Probably not. As Professor Irving Fisher has pointed out, an expansion of world credit currency is to be looked for in the future. This expansion is the more likely to occur if the volume of production increases with heavy underlying costs. Furthermore, it may be added that if labor in general becomes more efficient, labor in the gold mining industry will also become more efficient, thus increasing the output of gold and making an additional expansion of credit possible. In a paper entitled the "New Price Revolution" written by Professor Fisher, the leading authority on prices, for the Department of Labor, his conclusion is summed up in this paragraph:

"The fundamental practical question confronting business men is whether the general level of prices is going to fall. In my opinion, it is not going to fall much, if at all. We are on a permanent-

ly higher price level. . . . Our currency is not inflated at the present time relative to the new level of prices in the world which the war has brought about. The country's volume of money will have to be judged in terms of this new price level, not in terms of a price level that is past."

OTHER FACTORS AFFECTING PRICES.

In the foregoing discussion of the prospect of price reduction resulting from a possible decrease in the cost of production, some points occasionally brought forward as a basis for a prediction of decrease in price and hence in cost of construction were omitted. These will now be briefly considered.

In some quarters a decrease in freight rates is expected to decrease the cost of construction. The answer to this is that the transportation industry can be considered as included in the analysis of cost of production made above. As long as the cost of transportation, including wages, materials and taxes, does not decrease, there cannot reasonably be expected a reduction in freight rates. In the case of transportation, there have been during the war no abnormal profits, but on the contrary deficits. The only hope for decreasing the cost of transportation is increasing efficiency and this cannot be expected to result in an early reduction in freight rates.

CONDITIONS FOLLOWING CIVIL WAR NOT ANALOGOUS.

Many persons point to the fall in prices after the Civil War as an indication of falling prices after this war, but the conditions now are not the conditions following the Civil War and one cannot reason by analogy when there is no analogy. Prices in the United States in 1865 were high by reason of our own Civil War. Prices are high in the United States at the present time as a result of European conditions reflected in the United States. As a general rule economic disturbances and changes are the more permanent in proportion as they are more widespread. Hence, naturally, we cannot expect as rapid a readjustment of prices after the

world war as came about after our Civil War.

As it is now five months since the armistice was signed, we have already a considerable period for which we may compare the course of prices with a similar period in the Civil War time. Let us note the actual price movement during the four months after the surrender of the Confederate armies was a certainty and the movement of prices after Germany's surrender was foreseen. During the four months from January 1 to April 30, 1865, the index number of wholesale prices declined from 216 to 190, a drop of 12 per cent. During the four months from November 1, 1918, to March 1, 1919, prices in the United States declined only 5.9 per cent., according to Dun's index number. During March prices reacted so that the index figure for April, 1919, is only 4.6 per cent. under that of Nov. 1, 1918.

We cannot expect in the near future lower prices in the United States as a result of lower prices in other countries, since our prices are low in comparison with European prices. They are almost the lowest in the world. Instead of needing to fear an influx of cheap goods from abroad because of our high price level and a consequent fall in price, we can in all reason expect a period of heavy exportation because of our comparatively low price level.

PRESENT CONSTRUCTION COSTS COMPARATIVELY LOW.

What then are we to say concerning the construction industry as affected by a possible fall in prices? As our analysis above indicated, the only reason for expecting a general fall in prices is the disappearance of abnormal and excessive profits of certain industries benefitted by the war. As already pointed out, it cannot be expected that such a fall in prices will be very pronounced. If prices in general, and hence costs of production in general, do not fall materially, it is not to be expected that costs of building construction can fall materially since these costs are at present comparatively low.

It is to be remembered that the construction industry was curtailed, instead of stimulated, during the war. In order to divert the materials, labor and credit normally employed in the industry, severe restrictions both on the production of materials and on construction were enacted. The output of sixteen building materials, for example, was reduced twenty-five to sixty per cent. Because the construction industry was one of those that were repressed during the war, wages in that industry and also prices of building materials were kept down, the metals group of materials forming the most notable exception to the rule.

BUILDING NOW A SAFE INVESTMENT.

It is possible that some building materials may come down in price, but it is just as probable that some other building materials or the wages of some trades in the building industry may go up. The reductions in steel prices, including those of March 20, 1919, have brought the finished steel products index number down from 228, in November, 1918, to 195 at present, a drop of not quite 15 per cent. But the effect on the cost of construction has already, in some communities, been largely or wholly offset by wage increases. Even in the case of a high-grade steel skeleton office building, as we have seen, the percentage of increase in cost is far below the percentage of increase in the general index number for commodity prices. One can hardly escape the conclusion, therefore, that the cost of construction will not come down to such an extent as to endanger a judicious investment made in the erection of a new building. Where the rents offered show a fair net return on the cost today of a new building, after deducting a reasonable sinking fund allowance, no one should hesitate to build or to lend money for building.

RISING RENTS.

Rents are determined by supply and demand. In the case of housing, during the early part of the war, the demand was curtailed by the rapid advance in

commodity prices, which impelled many tenants to crowd into or get along with less space than their normal standard of living required, and by the drafting of the young men of military age. Within a year, however, these influences had spent their force. By the end of 1918, according to the replies obtained from a questionnaire sent to real estate boards in 91 cities, only four of these cities had a housing demand that was below normal; while in 52 cities rents had advanced 10 per cent. or more, in some instances 40 per cent. to 50 per cent. This rise in rents took place at a time when the population at home was as economical of house room as possible and while several millions of soldiers were absent in the service.

LAND VALUES CERTAIN TO ADVANCE.

Another important fact was disclosed by the replies to the questionnaire, namely, that despite rising rents for housing in the majority of the 91 cities, the market values of house sites had declined in six cities, and had remained practically stationary in 72. The market value of land is, like rents, determined by the interplay of supply and demand. During the war the demand for city land was relatively small, because dealing in real estate was discouraged by the banks as a non-war activity requiring the use of credit. With a restoration of easier mortgage loan conditions, the demand for real estate will inevitably increase; nothing can seem more certain than that in our growing American cities, the market value of land must advance briskly. City land at present is probably the least inflated of all material wealth.

INCREASE IN CONTRACTS AWARDED.

Evidently this line of reasoning is being adopted by growing numbers of practical men, for recent construction figures show a remarkable increase. In March, the aggregate of building and engineering construction contracts awarded in the district north of the Ohio and east of

the Missouri was \$151,000,000, as against \$95,000,000 in February and \$51,000,000 in January, the lowest month since the government began to cancel war projects. The total of contracts awarded in March of this year is the largest of any corresponding month as far back as our records go, except March, 1917. The March totals for the last seven years, translated into the 1918 price level, are as follows: \$151,000,000 in 1919; \$116,000,000 in 1918; \$153,000,000 in 1917; \$132,000,000 in 1916; \$118,000,000 in 1915; \$89,000,000 in 1914; and \$94,000,000 in 1913.

BACK TO PRE-WAR LEVEL.

The contracts awarded cover every construction contract of whatever kind, both in cities and in villages and rural districts. They show that the revival of the construction industry is most notable outside the large cities. They show, further, that the greatest activity is in housing (dwellings and apartments), followed first by industrial plants and next by stores, offices and banks. The bulk of the work is for private owners; public work, though increasing, is comparatively slow in reaching the contract stage.

IMPROVEMENT TO FOLLOW VICTORY LOAN.

The very notable increase in construction activity, mainly outside the big cities, revealed by the contracts awarded was achieved in spite of hesitation by bankers to make long-time commitments before the Victory Loan is floated. Each bank must be in a position to take care of its allotment of the Loan and must husband its resources until events make clear how large a part of its allotment it can sell to the public and how large a part it will be obliged to retain. When the Victory Loan is out of the way, the banks will be more free to act on applications for mortgage loans, and we are likely to see a sharp upward turn in the building permits of the larger cities.

**CARSON C. PECK MEMORIAL HOSPITAL
AND NURSES' HOME, BROOKLYN, N. Y.
LUDLOW & PEABODY —ARCHITECTS**



By
LEON V. SOLON



HYGIENE AND MENTAL STATIC.

MODERN efficiency no longer confines itself to the manipulation of material things. For some little time certain phases of art activity have been claimed as accessory to its ends, which on occasion are hitched to the team. In this extension of the sphere of efficiency, architecture has naturally figured prominently, not merely by contriving premises for economic production of convenient operation, but in endowing with psychic properties masses of structural material, evolved to meet more intimate requirements of our civilization.

The prime purpose of efficiency is to redirect all energy wasted through unnecessary friction or duplication of effort; its secondary aim is to induce mental processes that are helpful to the accomplishment of the set purpose, and that neutralize antagonistic forces.

An increasing complexity in human interests and requirements makes it imperative that a self-contained subject, such as the hospital, be disentangled from complicating side issues, and that everything contributing to the realization of the main idea be conceived with clearness, indirectness having no place in true efficiency.

A propitious mental state is almost as important a factor in the recovery of lost health as is treatment and hygiene; in fact, from all time, cures have been operated by this means alone. Recognition of this element makes it compulsory to consider many subtle factors extending even into the fields of decoration and accessory equipment, including numerous considerations, apparently

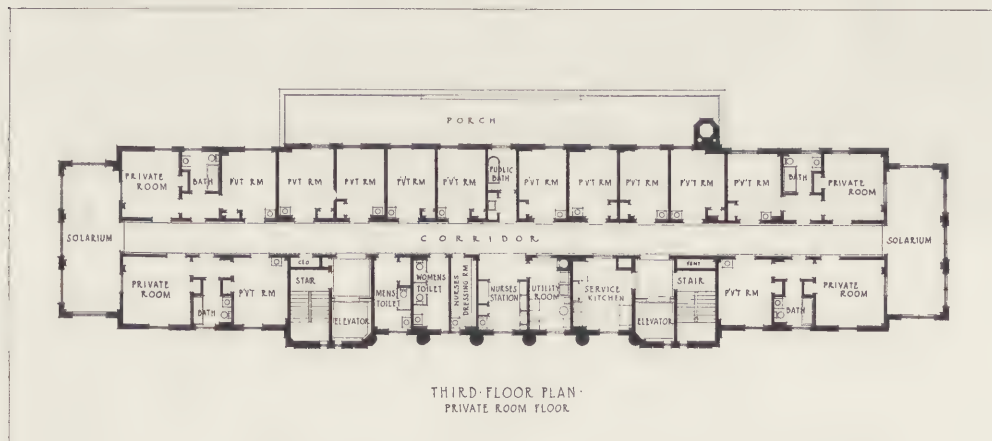
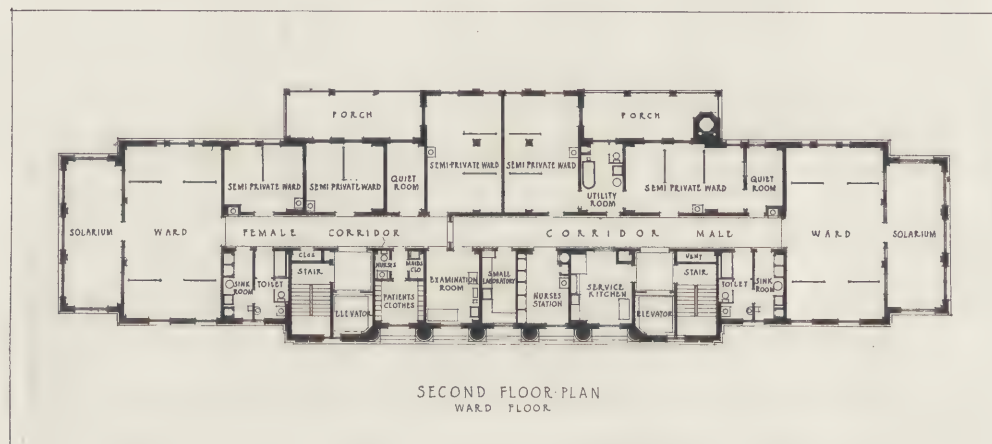
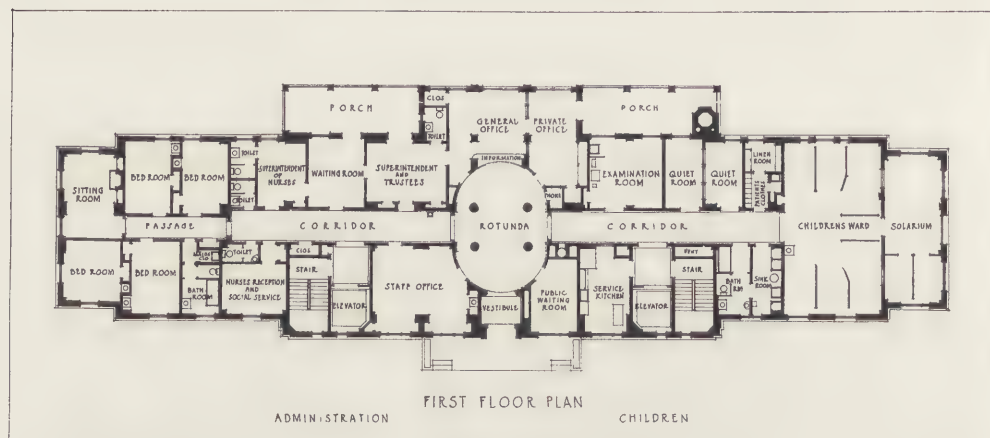
trifling, which however react beneficially on the minds of those reduced to a hypersensitive condition through illness.

The psychic power of architecture has been a recognized asset, almost as far back as the days when shelter was the sole purpose of construction. The fortress was so designed that an impression of impregnability wrought discouragement in the rank of the enemy, thereby giving the defenders the consequent advantage. The loyalty of the subject was stimulated, while he was overawed, by the magnificence and dignity of the ruler's court. As mundane standards of comparison and judgment were often dangerous to the prestige of priestcraft, it was necessary to invest the temple with mystery, that a plastic condition of mind might result in the followers of the cult, making them more receptive of the needful impressions. It is characteristic of modern times that as impressions are registered more rapidly, they become less permanent, and that a fertile suggestion makes a deeper impression in many cases than statistics—a fact exploited to the utmost by our more skillful advertising men. The automatic deduction which has generated through the appearance of a building in former times was of an elemental nature, appertaining to the simpler emotions; today the process is more intricate due to the reason that the desired deductions are often of a complex nature, for which the more obvious means for stimulation are ineffectual.

Since the advent of the science of hygiene all matters connected with the



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DETAIL OF ENTRANCE LOBBY, CARSON C.
PECK MEMORIAL HOSPITAL, BROOKLYN,
N. Y. LUDLOW & PEABODY, ARCHITECTS.



DETAIL SHOWING COMBINATION OF BRICK AND TERRA-COTTA, CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, Y. N. LUDLOW & PEABODY, ARCHITECTS.



NURSES' HOME, CARSON C. PECK MEMORIAL HOSPITAL,
BROOKLYN, N. Y. LUDLOW & PEABODY, ARCHITECTS.

building of the hospital have naturally been subject to its ruling. Its decrees, arbitrarily enforced in the making of a hospital, made a clean sweep of all that rendered human habitation endurable. The aesthetic sense of the modern medical scientist, if we may hazard the implication, seems moulded after the model of the Cromwellian reformer and iconoclast, whose place of worship must be repellent to be adequate. Suspicion has evidently been cast on anything on which the eye of the sick man might rest with satisfaction, be it color, decoration, or meagre luxury. True, the operating theaters of many hospitals are tiled with soft toned glazes, in lieu of the shining white; but, as the majority of the patients in that room are under the influence of an anesthetic, we may assume that the comfort of the medical staff is the objective.

The conventional appearance identified with a sanitary hospital building, its repellent and comfortless air, is more

terrifying to the highly strung individual than an accidental contact with a mortuary; possibly because the idea of Death itself is less appalling to the sick than the suggestion of a grim approach. There is probably no subject set the architect in the range of practice, where there is such a scope and need for human sympathy, ingenuity and forethought, as in that of the hospital; or where the successful solution is rewarded with such heartfelt appreciation. An ardent desire to create ease for the afflicted must be quickened by a philanthropic temperament; he must remember that he is building a refuge for the sick, not exclusively a fortress against the germ, as the elemental idea of the hospital—an edifice to house hideous disease and human wreckage—is not stimulating to the esthetic sense.

It is incumbent on the architect to remind the "case" by suggestion through its surroundings, that in the complement of a dual existence, it is an individual,



TYPICAL SOLARIUM, CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, N. Y.
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not a disease. He must modify the traditions of the sanitary structure without impairing its benefits, and refrain from providing premises for those in mental and physical distress that would be unendurable in robust health. To ascertain the value put upon many of the measures enforced in the hospital, it would be instructive to know whether the scientists who formulated these drastic measures carry their conviction to the length of relegating themselves to their tiled bathrooms when ailing, by reason of its sanitary treatment and comparative absence of germ carriers; or whether a sense of well-being is sought in preference as more directly beneficial, and a chance taken in the midst of comfortable upholstery, curtains and carpets, regarded theoretically as stock farms for pathogenic bacteria.

From time to time we have read of experiments made by eminent scientists with color, to gauge its influence on the temperament of zoological specimens. Wild animals are reported to have responded to a remarkable extent, being abnormally irritable when existing for



A CHILDREN'S WARD, CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, N. Y.
Ludlow & Peabody, Architects.



A CHILDREN'S WARD, CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, N. Y.
Ludlow & Peabody, Architects.

a lengthy period in one colored light, and unusually joyous and docile in another. Color is so conspicuous a factor in our daily outlook that it cannot be suddenly eliminated from our sight in a hospital without necessitating some unnecessary mental adjustments; at a time when a static mental state is imperative, such a process may not be politic.

Messrs. Ludlow & Peabody have decided that their hospital should be a home for the sick, rather than the conventionally treated hospital, their objective having been attained without the sacrifice of any measures of safety or prevention. This has stimulated them to make departures, in many directions, from the current ideals of barrenness and desolation which fill the stricken with despair.

This building was erected as a memorial to Carson C. Peck, by his widow, which called for the suggestion of the monumental treatment which the architects have introduced in the façade. It is partly endowed; the endowment covers a proportion of the cost of mainte-



PUBLIC WARD OPENING ON SOLARIUM—EACH BED IS SCREENED FROM ITS NEIGHBOR TO GIVE A FEELING OF PRIVACY—CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, N. Y.

Ludlow & Peabody, Architects.

nance to the extent that it may be available to persons of moderate means, who find service and comforts there which elsewhere would be beyond their purse.

The façade is well conceived and proportioned, the difficult problem of fenestration being cleverly handled. The use of columns imparts the impressive air we associate with the commemorative structure, and stabilizes the tendency to restlessness that often proceeds from diversity in the size and alignment of openings. The manner in which the relation of stone to brick has been adjusted, from the point of view of color interest, is very satisfactory; it is regrettable, however, that this combination has not the decorative development on the solarium walls at each end of the building, as the box-like appearance of these extensions might thereby have been neutralized. As they are, they detract from the general scheme, and one cannot

help feeling that the joyous intent of the sun-room might have been suggested by an appropriate decorative combination of the contrasting color and the texture of brick and stone; but the critic sometimes assumes that an opportunity has been overlooked, which, had he been acquainted with the monetary appropriation, he would realize had never existed.

Considerable thought has been given by the architects to the question of color, even to the selection of the most harmonious stains for trim and floors. The windows are cheered with printed curtains, in defiance of the dictum pronouncing them havens of refuge for the ubiquitous germ; the curtain designs are bright and quaint and give the sick-room the appearance of a cheerful bedroom in a simple country house; and as the material is just as easily laundered as the bed linen, there is little risk that the patient's sense of comfort will be charged to his physical account. Small rugs of pleasing

tone supply their complement of color to the scheme; pictures adorn the walls, and provision is even made for hanging favorite pictures from the patient's home—duly sterilized we may be sure.

The solariums are arranged after the conventional plan, nearly all open, with windows to shield from the cold winds. On the rear the porches are approached from the adjacent bedrooms by casement windows, so that beds and wheel-chairs can be rolled into these from the rooms. These get the southern sunlight and enjoy an extensive view over many miles of Brooklyn extending to the Narrows.

The interior walls have been tinted a cheerful sunny buff, equally pleasing on the dull days of winter or during an over-bright summer day. Throughout the buildings every effort has been made to get as much light as possible, so windows are made as extensive in area as the exterior design would permit. The little iron hospital bed is taboo in the private wards, and wooden beds painted in attractive colors take its place; these

are treated in such a way as to harmonize with the oak or mahogany bedroom furniture.

Throughout this building the architects' concern has been for the individual who sojourns there, rather than the creation of the institution at his expense. Innumerable kindly contrivances have been introduced at the outlay of much thought and study, which take into account the fads, fears and fancies of the suffering, and the sensibilities of overwrought nerves. The jaded appetite of the invalid has been a determining factor in the choice of the pottery tableware, and a variety of patterns chosen, in place of an institutional design, so that the recurring article of diet may appear less distasteful through its varied presentation.

Lighting fixtures have been placed with great care in order that the rays may be concentrated on essential spots, and the eyes of the occupant of the room may suffer no unnecessary strain.

The signal service from the head of the patient's bed is contrived to relieve him of any fear that his call has not



OPERATING ROOMS—WAINSCOT AND FLOOR TILED IN HARMONIOUS TONES—CARSON C. PECK MEMORIAL HOSPITAL, BROOKLYN, N. Y.

Ludlow & Peabody, Architects.

registered, and that help may not be forthcoming. A pear-push hangs on a wire at the head of the bed, close to the patient's hand, which on being manipulated registers with lighted bulb in the nurses' station, sink room, diet kitchen on the same floor, and the head nurse's room on the first floor. This signal can only be cut off by pushing a ring on the pear-push with which the call was made. The head nurse is able to note whether calls are promptly attended to, by the duration of the lights. One of these tiny signal lights shines over the patient's door, conveying the reassuring information that the signal is visible in the other parts of the building.

The banging of elevator doors, which is so startling and annoying in a hotel, or even in an office building, is a very serious matter in a hospital. The architects have contrived their plan so ingeniously that elevators open on vestibules instead of on the corridors. The clicking latch has been eliminated for noiseless contrivances with arm-hooks instead of knobs, so that a nurse can open the door even if her hands are occupied. To insure still further quiet, the partitions of nearly all the bedrooms, other rooms, and halls, are built double with air spaces between.

The entrance lobby is decorated in a warm Pompeian color scheme; the Doric caps are treated after the orthodox manner of Aegina. A panel in mosaic with an inserted metal medallion gives decorative interest to the terrazzo floor. The tone values of the colors in this rotunda are well adjusted, with the exception of that of the base of the walls and columns, which is too high in key; the optical defect proceeding from such a choice of tone is that there is a sense of suspension in the superimposed areas.

The nurses' home is a simple, but characteristic building. The brick used here and in the main building is well handled; an attractive effect results from the introduction of a lighter brick in irregular spotting, giving a color charm to wall surfaces which would otherwise be deprived of interest. The brick paneling in the upper story is well judged, and the

cornice ingeniously contrived. The appearance of this building is homelike, and should aid the nurses in distracting their minds for a time from the pathetic scenes surrounding them while on duty. From the psychological aspect sufficient emphasis can hardly be placed upon the contrast needful between the nurses' home and the wards, in order that the personnel may retain their normal mental balance and avoid the morbid or callous state of mind resulting from constant environment.

The terra-cotta work in the exterior is of that technical excellence which now characterizes the American product. In the modeling of the detail, however, we find a lack of refinement and little comprehension of the essential subordination of treatment to material; this heavily discounts its technical perfection.

Terra-cotta is a material of such vast service to the architect with so brilliant a decorative future that the time has come when the architects of this country must awaken to the fact that clay has a beauty of its own and a distinctive type of ornamental and sculptural expression, to the same extent as bronze, wood or stone. Terra-cotta which expresses the plasticity of clay is an infinitely more beautiful product than terra-cotta masquerading as limestone. The architect who demands an imitation of stone carving in clay does not appreciate the model he sets; the character and beauty of stone carving are evolved by peculiarities of substance; these cannot be translated indiscriminately, even for motives of economy—true appreciation precludes parody.

Wherever the architect of recent years has cultivated connoisseurship in the decorative treatment of a material, progress has been instantaneous and considerable. It is only a question of time, or more probably of leadership, when terra-cotta will be recognizable on our buildings as a plastic material.

Messrs. Ludlow and Peabody are to be complimented on a thorough and an interesting work. The hospital as a subject is neither exhilarating nor inspiring;

nevertheless their design is invested with dignity and repose and conveys most adequately the memorial idea which was responsible for its inception. Their plan

is excellently contrived, replete with ingenious thoughts. Those who succeed in brightening the outlook of the stricken have not toiled in vain.



ENTRANCE DETAIL, NURSES' HOME—CARSON
C. PECK MEMORIAL HOSPITAL,
BROOKLYN, N. Y.
Ludlow & Peabody, Architects.

The SOCIAL CENTER

PART I - COMMERCIAL AND COÖPERATIVE ENTERPRISES.

By
Fiske Kimball

THE elemental need of human intercourse, we have come to recognize, has been starved and neglected in modern industrial life no less than the need of food and shelter itself. The city wilderness of slums and poverty teems also with a hunger for companionship, too often compelled to go unsatisfied, or satisfied at the peril of society. Social workers bitterly realize that the drab existence of the garments workers is scarcely one to fill exiles from the Russian pale with enthusiasm for American institutions. In the city, "where play is crime," the corner gang finds its enemy in the police, and its animal spirits become a menace instead of an asset. The mushroom growth of industrial communities during the war has made these conditions even more painfully acute. Their relief involves the provision of adequate social facilities for all the less-favored groups, a task of tremendous scope, which commercial, philanthropic, and civic enterprise alike are still far from having accomplished. Each of these forces, however, has already made its significant contributions to the solution of the problem, and it is from the elements already developed and tested by practical experience that the ideal creations of the future will come.

Commercial agencies—intent, of course, on their own profit—do much to combat the barrenness of industrial life, and frequently offer the sole available escape from its grinding. We must acknowledge that the saloon, the pool room and the public dance hall, directly or indirectly connected with the saloon, have been in fact the chief social centers for the great body of city dwellers to the present. Whatever their demerits, they have had,

beside the sale of drinks, many powerful forces of attraction, and many qualities which philanthropic or civic enterprises must emulate if they are to draw and hold the attendance of their constituency. Thus the saloon, for instance, is completely democratic, opening its doors to all and offering to each the personal welcome of the keeper; there is no limitation of time; there is something to act as a stimulus to self expression and put a man in a social temper. The saloon has acted, moreover, as a political headquarters, as an employment bureau, a loan agency, and an inexpensive lunch room. Whatever one's attitude toward the abolition of the saloon, one must recognize that in this event such positive advantages and facilities must not be sacrificed. With the national adoption of prohibition it becomes imperatively necessary to provide adequate and acceptable substitutes for the social provisions which will be abolished. Even were the licensing system to continue to be employed, it would be scarcely less essential to supply decent and orderly places which might make these social provisions free from association with corruption and vice, and accessible to those of both sexes and all ages.

Certain commercial enterprises, fulfilling social needs in some degree, are of course free from the drawbacks suggested; and, in the measure that their success brings wide establishment, these tend toward the solution of the problem without the intervention of charitable or governmental agencies. Thus the amusement parks maintained by electric railways and excursion steamboat companies bring recreation to thousands of city dwellers in summer. Most profit-



RECREATION BUILDING, DETROIT, MICHIGAN.
SMITH, HINCHMAN & GRYLLS, ARCHITECTS.



Fourth Floor Plan.
RECREATION BUILDING, DETROIT, MICHIGAN.
Smith, Hinchman & Grylls, Architects.



Second Floor Plan.
RECREATION BUILDING, DETROIT, MICHIGAN.
Smith, Hinchman & Grylls, Architects.



SECOND FLOOR—RECREATION BUILDING, DETROIT, MICHIGAN.
Smith, Hinchman & Grylls, Architects.

able and most wide-spread of all is the moving-picture theatre, the "house of dreams," which broad-minded social workers like Miss Addams have recognized as a valuable force in keeping children off the streets and encouraging families to seek their amusement together.

Where prohibition has removed the competition of establishments with the economic advantage of a bar, it seems likely that other social and recreative enterprises of a desirable type will be able to operate profitably. A notable undertaking of this sort is the new Recreation Building in Detroit, opened coincidentally with the operation of a "dry" amendment in the state. This is a large downtown building of seven stories, specially designed, costing with its equipment a million and a quarter dollars. It is devoted fundamentally to billiards and bowling; but to insure its attractiveness is provided with lounging rooms, restaurant, lunch counters, soda

fountains, shower baths, and so on, as well as a billiard theatre for exhibition matches. Intensive use of the floor space was of course required, so that these features are largely relegated to mezzanine stories, leaving the main floors free for fifty-three tables or twenty-two alleys each. One floor is entirely devoted to the use of women. As the alleys and tables provide for a thousand persons simultaneously, without counting spectators, it is obvious that the building is an important social factor in the community, and to some degree justifies its advertisement as "a vast public club." The opportunity to enjoy it, however, is naturally limited to those who can pay well, and this excludes the great majority, at least, of unskilled workers.

It is questionable whether enterprises of the sort, less luxurious and with a lower scale of charges, could make a profit without the addition of undesirable features. It is indeed very doubtful

whether any far-reaching social provision can be expected from commercial sources. In recreation facilities, as in housing, it is unfortunately true in general that purely commercial interests and truly social interests are in fundamental conflict.

Larger contributions to the solution of the problem have been made by enterprises in which the idea of financial profit is absent, but in which the people who benefit cooperate to support the undertaking, at least, in part. In England there has been a remarkable development of working men's clubs, primarily social in aim although with some educational features, which are managed entirely by their own members and are with few exceptions self-supporting. The number of these in 1905 was nearly a thousand, and the membership almost a quarter of a million. They supply cards and billiards, and give occasional entertainments to which the women of the families are invited. Although in the beginning of the movement it was

exceptional for these clubs to maintain bars, these have gradually been introduced almost universally. It has proved difficult without them either to hold the membership or to render the organizations self-supporting. The margin of financial success—never very great—is made possible, however, only by the English excise laws, which do not require a license fee of clubs not selling drinks to non-members. Thus it is questionable whether similar organizations could succeed under American conditions even with a bar, without some external support or endowment.

Fortunately in America such external support, especially in the provision of a building, has been very readily furnished, and organizations thus provided, maintained by moderate membership fees, have had especial success here. Chief among these are of course the Young Men's Christian Associations, with the corresponding Catholic and Hebrew associations and the similar organizations for women. Their field is espe-



FOURTH FLOOR—RECREATION BUILDING, DETROIT, MICHIGAN.
Smith, Hinchman & Grylls, Architects.

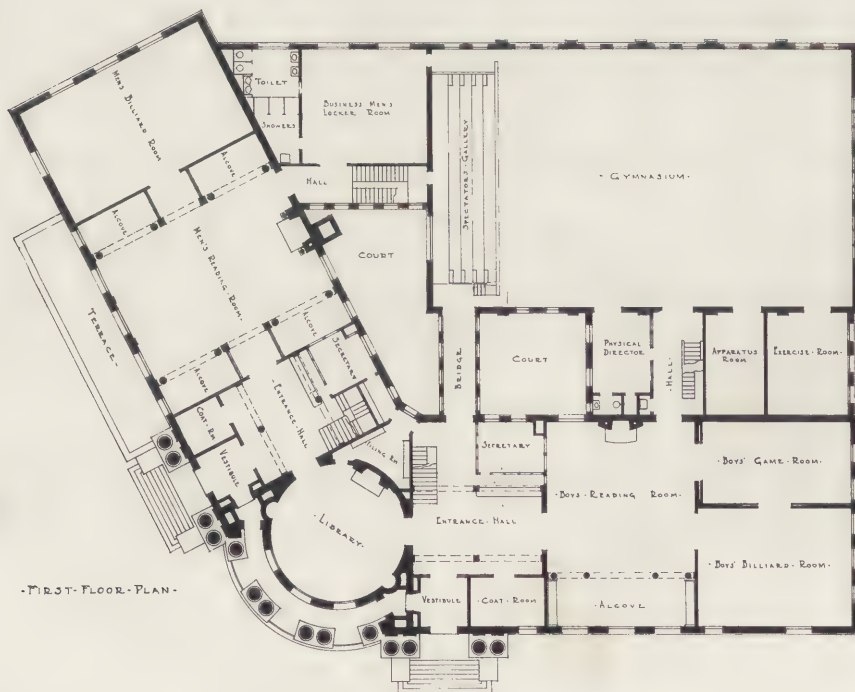
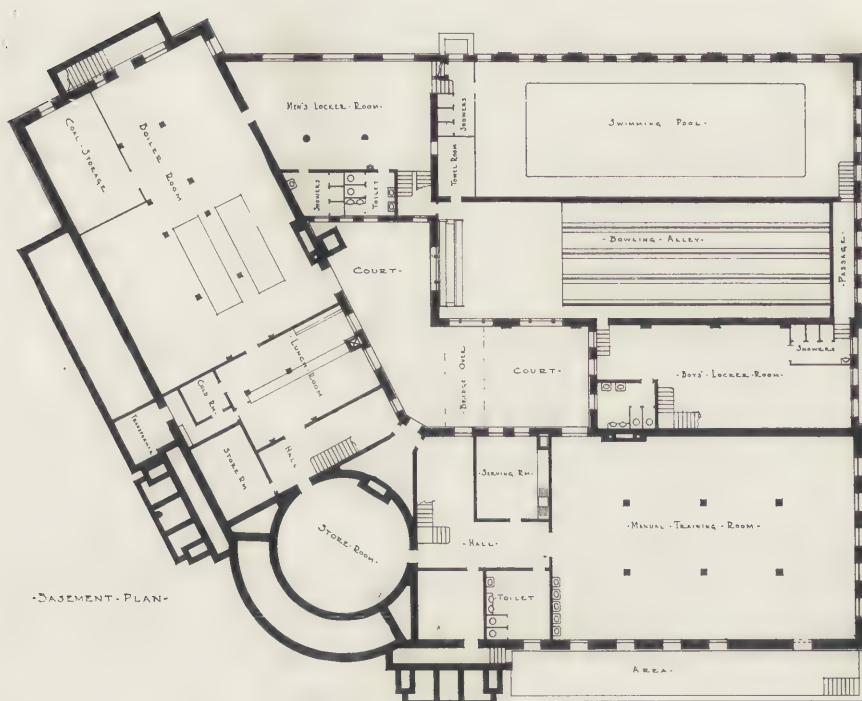
STANDARD PRACTICE FOR Y. M. C. A. BUILDINGS OF DIFFERENT CLASSES.

Main gymnasium (feet)	Auxiliary gymnasium (feet)	Pool (feet)	Lockers	Showers	Hand-ball courts	Billiard tables	Bowling alleys	Auditorium seats	Bedrooms
Brooklyn Central...78x86	2 of 50x56	25x75 18x60	310 men's (1785 boxes) 392 B.M.'s 204 boys' (1162 boxes)	30 men's 24 boys'	5	12 men's 8 boys' 7 men's	8	650	550
Cincinnati Central...53x85	33x53	25x75	.....	.....	3	4 boys'	6	....	200
Rochester Central...50x90	20x50	25x75	.....	.....	4	6 men's	4	400	310
Worcester .....50x95	45x60	25x96	.....	.....	1	7 men's	5	300	230
Springfield, Mass....60x80	40x60	25x75	200 men's (1210 boxes) 210 B.M.'s 100 boys' (500 boxes)	16 men's 12 B.M.'s 11 boys'		4 men's	5	300	104
Greenwich, Conn....55x75	18x60	6 men's 3 boys'	3	3 men's 2 boys'	4	300	38

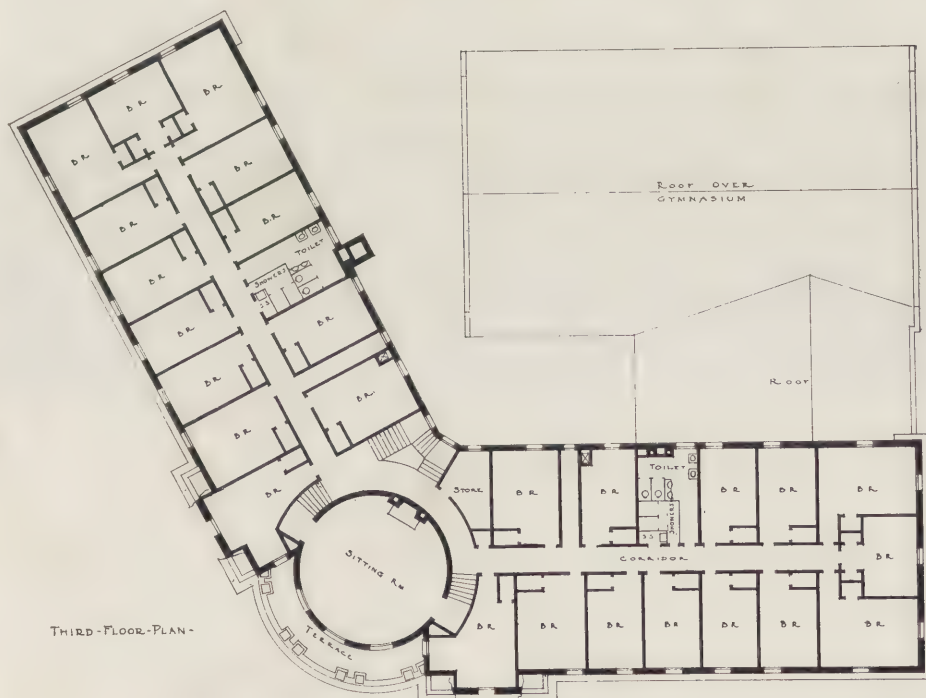
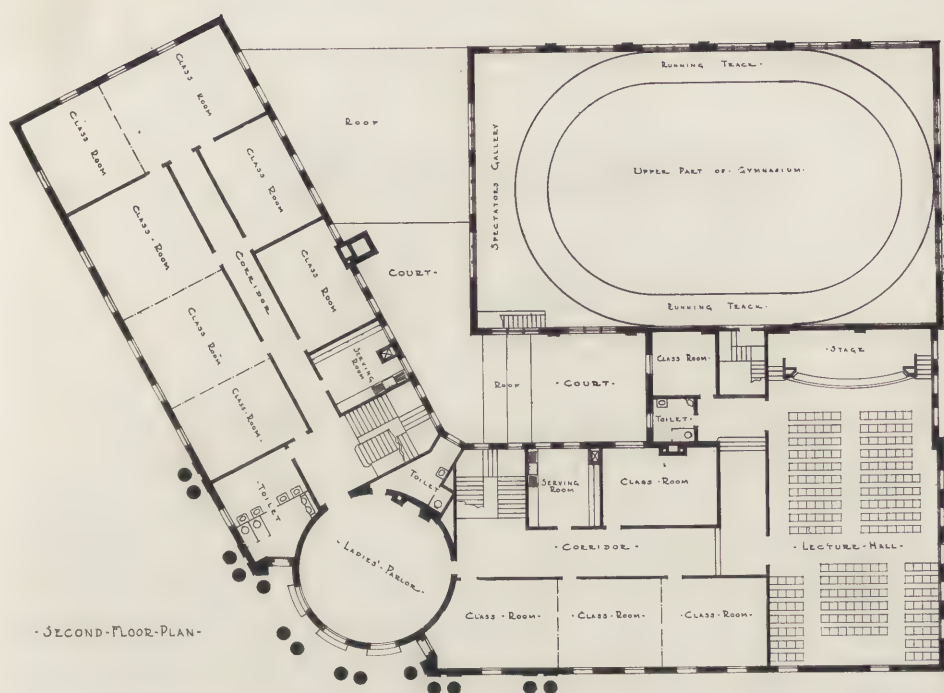


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GREENWICH Y. M. C. A., GREENWICH,
CONN. M. L. & H. G. EMORY, ARCHITECTS.



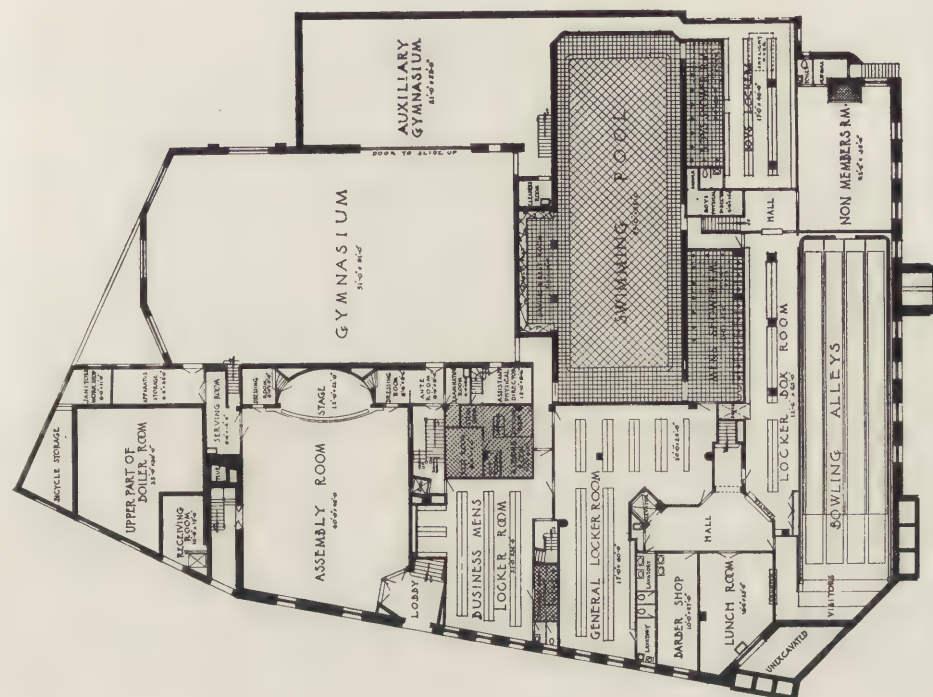
BASEMENT AND FIRST FLOOR PLANS—
GREENWICH Y. M. C. A., GREENWICH,
CONN. M. L. & H. G. EMORY, ARCHITECTS.



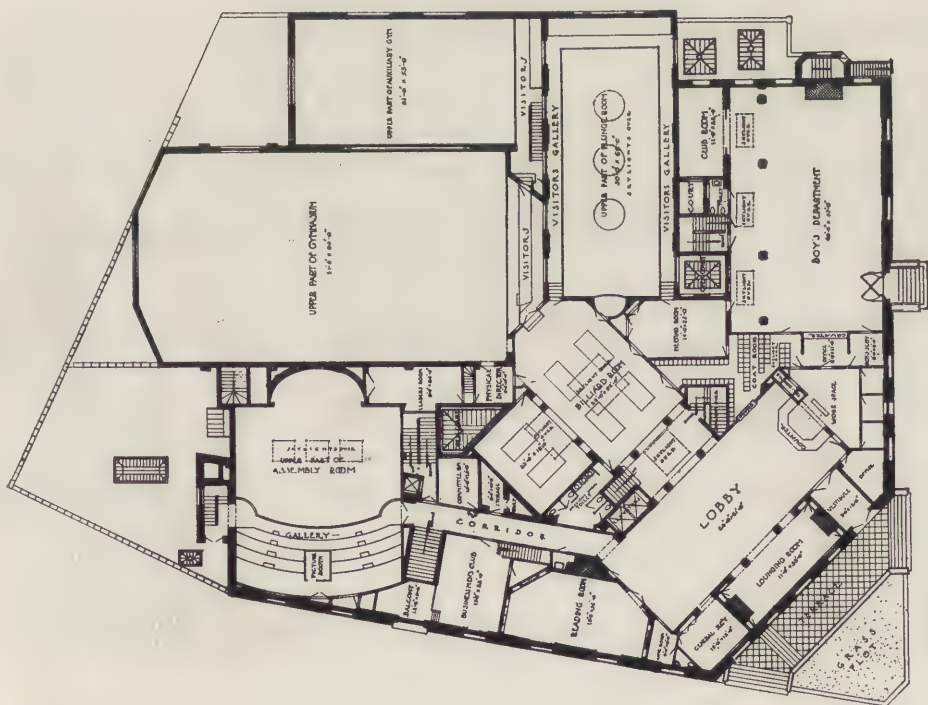
SECOND AND THIRD FLOOR PLANS—
GREENWICH Y. M. C. A., GREENWICH,
CONN. M. L. & H. G. EMORY, ARCHITECTS.



CENTRAL Y. M. C. A., ROCHESTER,
N. Y. JOHN F. JACKSON, ARCHITECT.



GROUND FLOOR PLAN—CENTRAL Y. M. C. A., ROCHESTER, N. Y.
John F. Jackson, Architect.



FIRST FLOOR PLAN—CENTRAL Y. M. C. A., ROCHESTER, N. Y.
John F. Jackson, Architect.



CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO.
Elzner & Anderson, Architects.



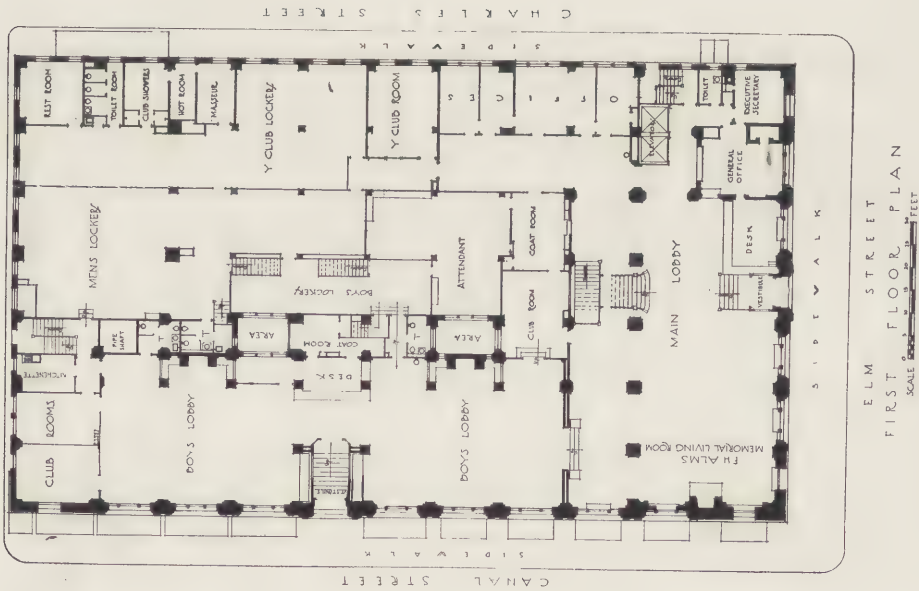
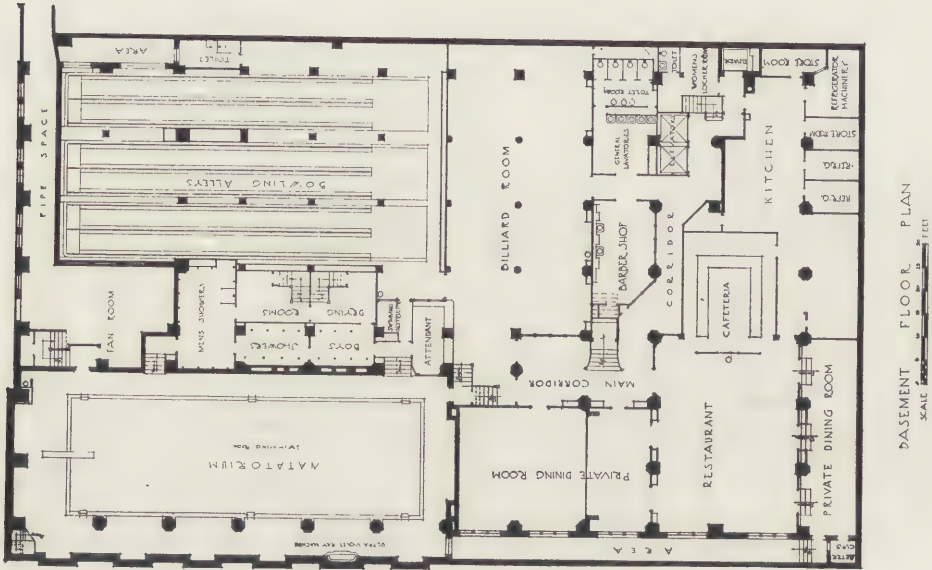
MAIN LOBBY—CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO.
Elzner & Anderson, Architects.



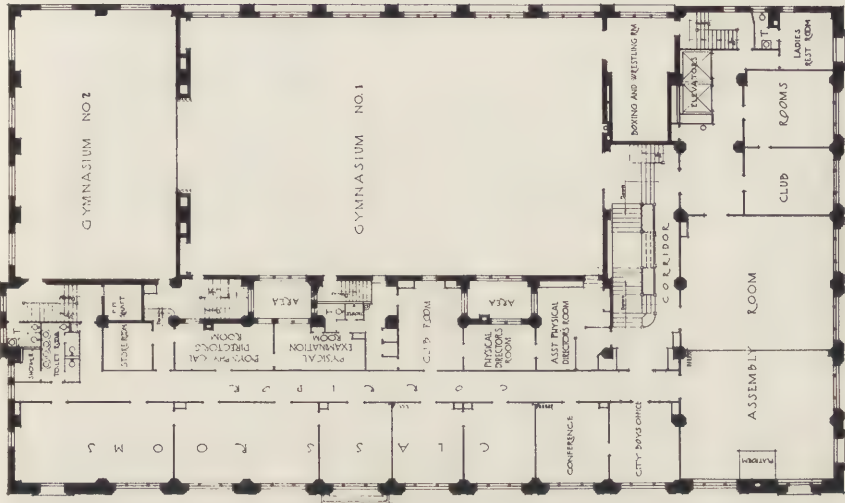
BOYS' LOBBY—CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO.
Elzner & Anderson, Architects.



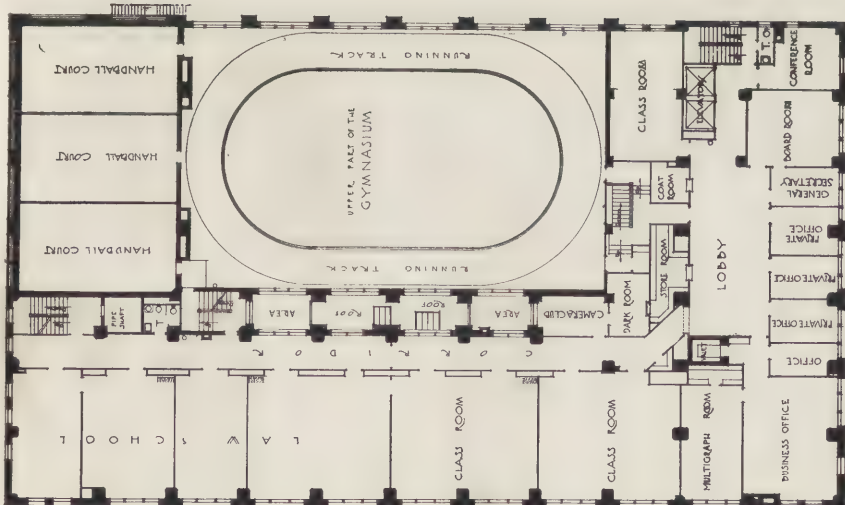
MAIN GYMNASIUM—CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO.
Elzner & Anderson, Architects.



PLANS OF THE CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO. ELZNER & ANDERSON, ARCHITECTS.

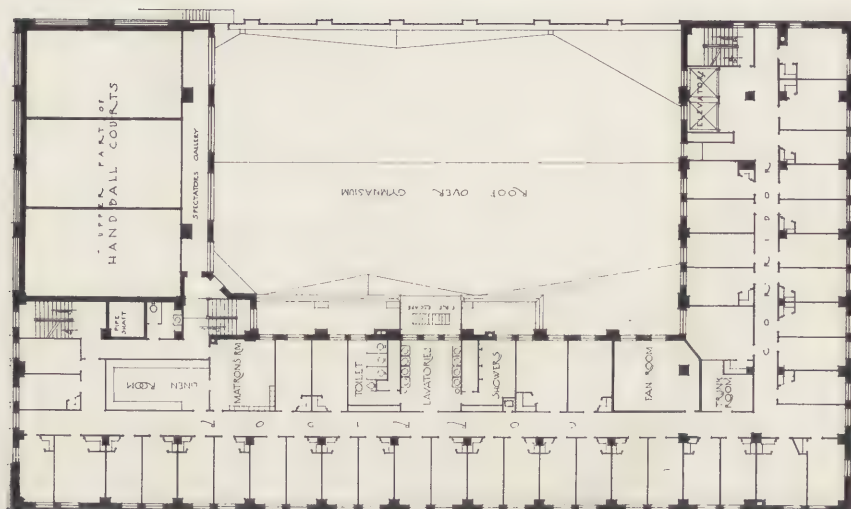


SECOND FLOOR PLAN
SCALE 1" = 10'

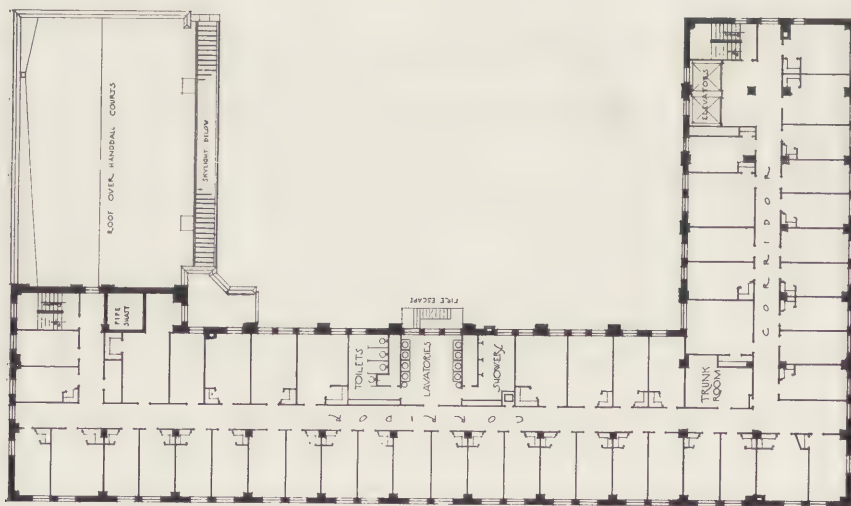


THIRD FLOOR PLAN
SCALE 1" = 10'

PLANS OF THE CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO. ELZNER & ANDERSON, ARCHITECTS.



FOURTH FLOOR PLAN
SCALE 1/8" = 1'-0"



FIFTH FLOOR PLAN
SCALE 1/8" = 1'-0"

PLANS OF THE CENTRAL BRANCH, Y. M. C. A., CINCINNATI, OHIO. ELZNER & ANDERSON, ARCHITECTS.



PART OF MAIN LOBBY, FREDERICK H. ALMS MEMORIAL LIVING ROOM—CENTRAL BRANCH,
Y. M. C. A., CINCINNATI, OHIO.
Elzner & Anderson, Architects.

cially the unattached youth of the cities, those of the commercial classes predominating. In general the Y. M. C. A. may be taken as the type of all. Its membership and resources are by far the greatest, and its buildings furnish the ideals for the others both in their size and provisions.

The city Y. M. C. A. building, with its well-known combination of social, educational, gymnasium, and dormitory facilities, offers a highly developed type, which has been standardized as the result of immense experience. Even the size and expense of the building best suited for communities of differing population are well understood, although with multiplying activities the standards are constantly rising.

On the eve of our entry into the war some of the newest buildings in different classes ranged as follows:

	Population (1910)	Cost
Staunton, Virginia.....	10,600	\$115,000
New London	20,000	140,000
Butte	36,000	200,000
Springfield, Mass.....	89,000	325,000
Worcester	146,000	377,000
Atlanta	155,000	425,000
Rochester "Central".....	218,000	610,000
Cincinnati "Central".....	364,000	565,000
Bklyn. "Central Branch".....	1,634,000	1,600,000

Each class has its own characteristic problems, and its own most successful recent solutions.

In the small city or town the controlling factor is the securing of simplicity and the convenience of supervision, so as to keep running expenses at a reasonable figure. Thus the administration department occupies a central position, with oversight of all activities by a small staff. To the left and right are the social departments for men and for boys, with their reading rooms, billiard



Photograph copyrighted by Wurts Bros.

CENTRAL BRANCH, Y. M. C. A., BROOKLYN,
N. Y. TROWBRIDGE & ACKERMAN, ARCHITECTS.



AUDITORIUM—CENTRAL BRANCH, Y. M. C. A., BROOKLYN, N. Y.

Trowbridge & Ackerman, Architects.

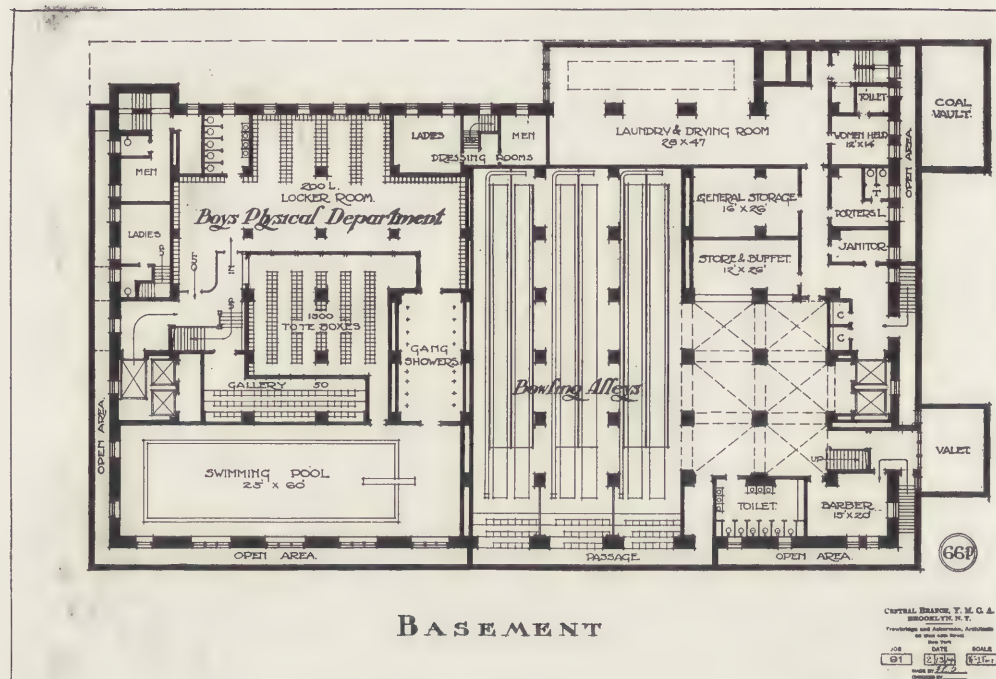
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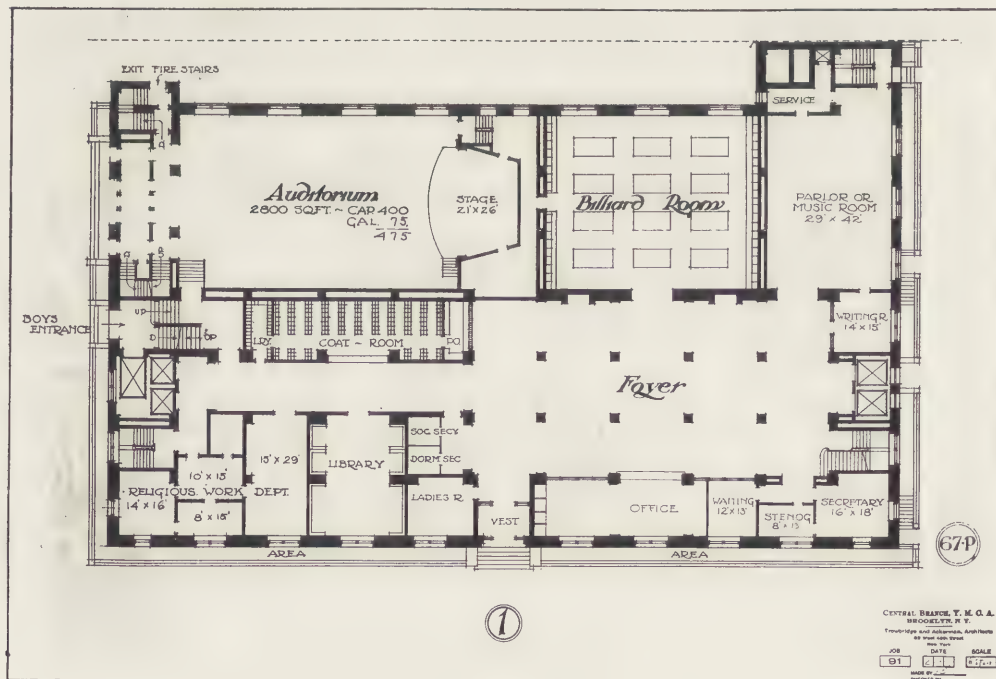
MAIN LOBBY—CENTRAL BRANCH, Y. M. C. A., BROOKLYN, N. Y.

Trowbridge & Ackerman, Architects.

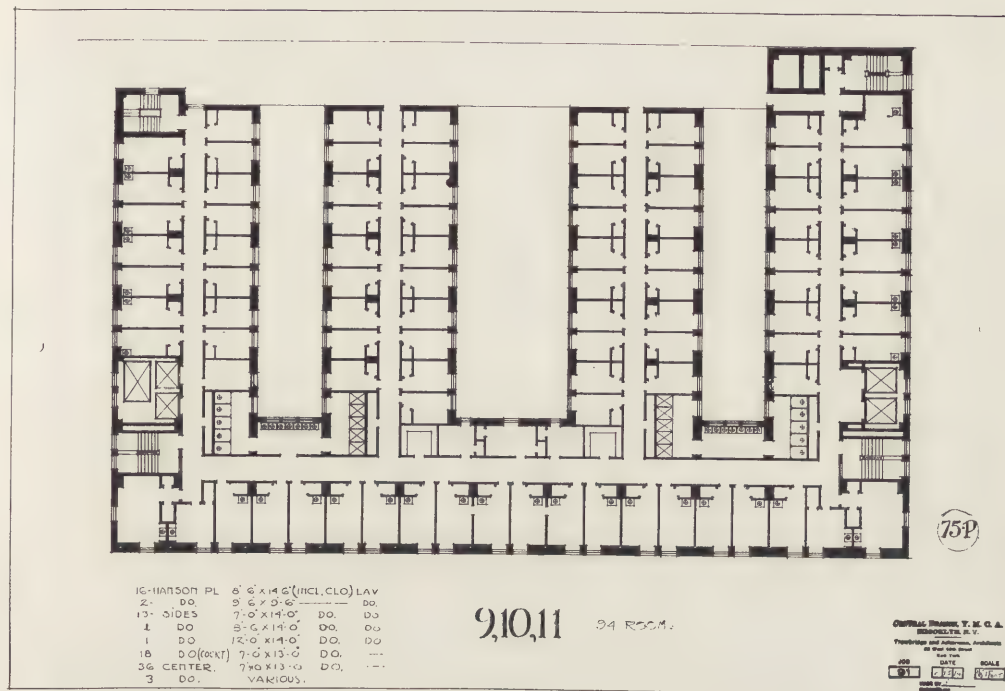
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BASEMENT PLAN—CENTRAL BRANCH, Y. M. C. A., BROOKLYN, N. Y.
Trowbridge & Ackerman, Architects.



FIRST FLOOR PLAN—CENTRAL BRANCH, Y. M. C. A., BROOKLYN, N. Y.
Trowbridge & Ackerman, Architects.



PLAN OF THE NINTH, TENTH AND ELEVENTH FLOORS—CENTRAL BRANCH, Y. M. C. A.,
 BROOKLYN, N. Y.

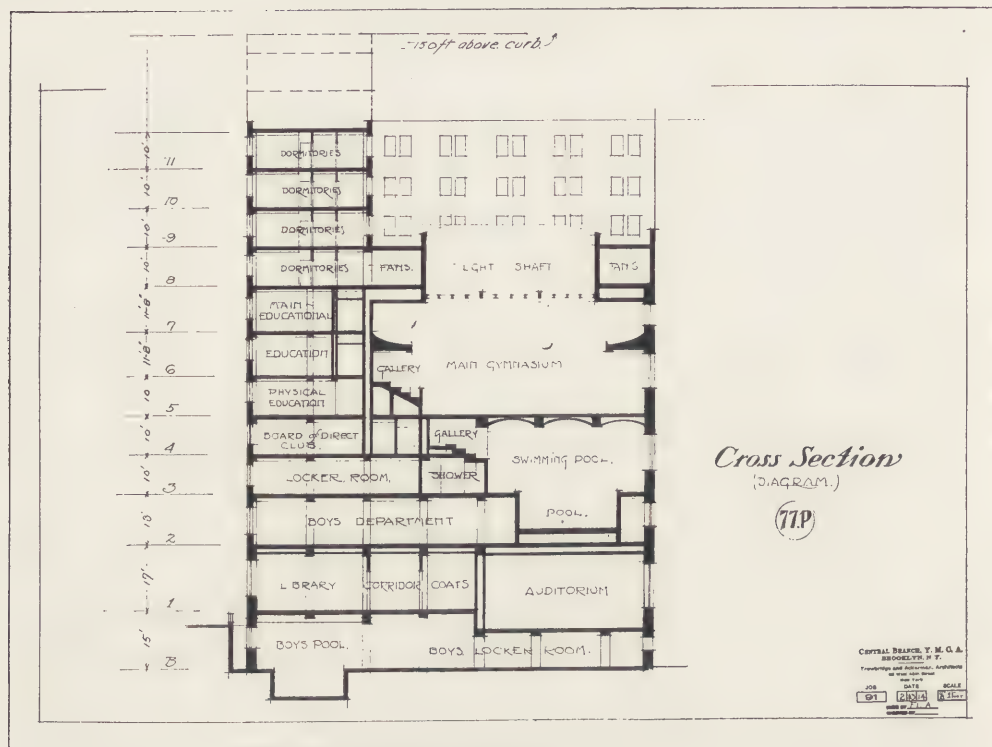
Trowbridge & Ackerman, Architects.

rooms, and club rooms kept separate; while the gymnastic department, including the gymnasium, swimming pool, and bowling alleys, is for the general use of all classes of members, at hours designated for the different classes.

Two of the finest of the recent buildings of this smaller type are those at Staunton, Virginia, where the family of Cyrus H. McCormick assisted in raising a worthy edifice at their ancestor's birthplace, and at Greenwich, Connecticut, where the entire structure was a gift in memory of Nathaniel Witherell. The building at Staunton is exceptional in having a public library combined with its facilities. The Greenwich building represents the ideal toward which the smaller communities that are less favored by individual donations are striving. Although its plan had to be adapted to a site of irregular shape, there is nothing in its analysis which is not generally adaptable. Standing at the obtuse angle of two streets, it has wings along them of equal size for the men's and boys' departments, connected by a

central circular pavilion containing the library. Separate entrances for the two classes are provided to left and right of this pavilion, and given an architectural unity by a connecting peristyle. Within, the offices of the secretaries face the entrances to each department and command the social rooms, yet adjoin one another for administrative convenience. The gymnasium and pool are behind, with access from the wings through the locker rooms of the respective classes. The basement provides bowling alleys, a lunch room and a manual training room; the second floor, eleven class rooms, capable of being grouped for large assemblies by folding partitions, and a lecture hall seating three hundred. The third floor has thirty-eight large bedrooms, with a common sitting room.

The larger cities require that the building shall stand on a circumscribed lot of expensive land, with the most economical utilization of space and a height of seven to twelve stories or even more. It must, moreover, have no confusion of functions, but a rigid separation of the



CROSS SECTION PLAN OF BASEMENT—CENTRAL BRANCH, Y. M. C. A., BROOKLYN, N. Y.
Trowbridge & Ackerman, Architects.

gymnastic as well as the educational and social provisions for different ages and grades of membership, even at the cost of multiplying the necessary attendants, and increasing the operating expenses. The separation of the men's and boys' departments extends to the gymnasiums—capable, however, of being thrown together for joint use when necessary. Special shower and locker rooms, with a club room in connection, are provided for business men of maturer years. The great expense of a pool, of course, in general forbids the provision of more than one for all classes together. For the younger men and boys the favored locker system is the space-saving one of "tote-boxes," with lockers only for use during actual use of the gymnasium; but to satisfy the business men full length lockers for permanent individual use are retained. Handball courts, Turkish baths, and barber shops are commonly provided, as well as both a restaurant and a lunchroom, and an in-

creasing number of class rooms; while desirable features added, with increasing frequency, are non-members' rooms both for men and for street-boys, laboratories, and dark-room facilities for a camera club. The proportion of dormitory area to the other features is large, the number of bed rooms ranging from a hundred to as high as five hundred, occupying nearly one half the entire floor space. Private baths and individual telephones are considered unnecessary; but bath rooms and telephone service are provided on each floor, with a buzzer call in every room.

Sharing these common requirements of the urban type, there are a number of solutions which answer to increasing size and compression.

In cities like Rochester, Springfield, and Worcester, where land values still permit, it is possible to keep the physical department wholly in skylighted lower buildings to the rear of the lot, with the gymnasiums usually on the main floor

and the pool in the basement. The large area of the main floor also permits placing there the main social rooms for both the men's and the boys' departments—preferably grouped to left and right in distinct wings—with separate entrances and with the administrative offices between. An assembly hall seating about three hundred, with its own public entrance, is also provided on the main floor if possible. The second story can thus be devoted exclusively to the educational and club rooms and the large dining room. From four to six floors of bedrooms, covering the main blocks only, provide from a hundred to three hundred rooms.

In somewhat larger cities, with a more restricted site, it becomes necessary to relieve the demands on the main story. At Cincinnati, the most recent example of the type, this has been accomplished by raising the gymnasiums to the second floor. To be sure, since the pool is still in the basement, this requires that the locker rooms shall be placed between, on the first floor; but by placing the men's billiard room down in the space freed in the basement a net reduction in ground area is secured. The differences in the height of the first story, occasioned by the fact that the social rooms of the front are necessarily higher than the locker rooms behind, are kept at a minimum and ingeniously masked by the arrangement of the lobby and the main stairs. Any large auditorium which might be made accessible to the public is precluded by the compression of essential features in all the main stories. Thus the religious and educational departments occupy all the space in the second and third stories along the two exterior sides of the lot, surrounding the gymnasiums. Although the bedrooms are carried up only along these exterior sides, the gymnasiums and handball courts are provided with side light, and have their roofs so strongly framed that it would be possible to secure extensions over almost the entire area of the lower stories.

By far the largest of the great central plants so far built, and one in which

the unique problems involved have received a masterly solution, is the Brooklyn "Central Branch," costing \$1,600,000. It covers a lot of 13,500 square feet, with a height of thirteen stories over the whole area except for necessary light courts, and provides for seven thousand members with full gymnastic privileges, and other classes in proportion. No attempt could be made in such a case to provide more than the men's social rooms (with the auditorium) on the first floor; and the problem of distribution was rather how best to assign the various floors to different departments, in convenient connection by stairs so far as possible, but in some cases necessarily reached by numerous elevators. Gymnasiums and even pools had to be placed wherever the coordination of the plans required—mostly, as it proved, high above ground. The distribution appears most clearly in the admirable set of preliminary drawings here produced, which the executed building follows with only minor variations due to crowding in still further facilities.

With the men's social rooms occupying the first story, the boys were assigned the second. The third went to the men's locker rooms and their pool (rising through the fourth story, devoted to minor rooms), with the three gymnasiums, immediately above, occupying the fifth and sixth stories from end to end. The boys' locker rooms in the basement are directly connected with the special pool which has been here provided for them, and are united with the gymnasium and handball courts by an elevator. The educational department, which in the preliminary plans occupied the front of the building in the three stories through which the main gymnasium extends, was eventually given an entire floor just above that, and the space vacated was employed for club rooms and additional bed rooms. The twenty-six class rooms with three laboratories, the library, the nine special club rooms, beside the main lounging and game rooms with twenty billiard tables and eight bowling alleys, show the great facilities of this vast social center for the city's manhood.

Special types of Y. M. C. A. buildings having their own problems are those for the Railroad Branch, the permanent Army and Navy stations, and the university communities. All these naturally lack the complexity introduced by the separate boys' department; but the development they may attain is indicated by the new Railroad Branch near the Grand Central Station in New York, costing a half million dollars.

There are, to be sure, large classes of the population which the Y. M. C. A. and the related societies have scarcely touched in the past—the industrial workers, the unskilled laborers, the sub-

merged foreign element in the great cities, many unable to afford even the modest membership fee of such an organization. In recent years, however, has come a great extension to factory towns, mining and logging camps, to the colored and foreign colonies, which marks a change of attitude in the work of the associations. With the universal provision of their facilities to the army and navy,—on the border, in the cantonments and abroad—free of charge and irrespective of membership, we may look for enormous future expansion in the associations' contribution to the great task of proving social centers.

UNITED STATES AERONAUTICAL SCHOOLS KELLY FIELD N°2, SOUTH SAN ANTONIO, TEXAS

By

Daniel B. Niederlander

IMMEDIATELY after the declaration of war against the German Empire in April, 1917, the much neglected aviation service of our army assumed a tremendously important position in the plans of the General Staff. Congress and the country at large also entertained extravagant expectations from our then very inadequate air service. Few people realized the magnitude of the problems to be solved, and fewer still thoroughly understood how pitifully inadequate our facilities for making airplanes and training aviators really were.

The general public is now more or less familiar with the work of the Signal Corps of the army and later the Department of Military Aeronautics in getting airplanes and pilots to our armies in France. Very little has been said or written about the work of the Construction Division of the Signal Corps in constructing and operating over thirty Flying Schools throughout the country. It is the purpose of this article to briefly describe the design and construction of one of the largest and most important of these schools, that at Kelly Field, about six miles southwest of San Antonio, Texas. This school is similar to others constructed in various parts of the United States, and along the same lines as those constructed abroad.

In April 1917, we had only four flying fields, and these were small and poorly equipped. The Construction Division of the Signal Corps came into being in May and was charged with the duty of selecting sites and constructing flying fields for the army of air pilots that our air programme required. The design of the necessary buildings to comprise a complete training school unit was entrusted to Albert Kahn, architect, of Detroit, Michigan. Work was commenced at

once on fields at Mineola, L. I., Dayton, Ohio, Rantoul, Ill., and at Mt. Clemens, Mich. Work was also pushed on the large experimental field at Langley, Va., which was then under way. The fields listed above were the first ones to be built and the only ones to be built in the north, as it was soon realized that it would be impossible to utilize these fields for training purposes during the winter months. All subsequent fields were therefore located in the south, where climatic and geographic conditions were more favorable, and more suitable and cheaper sites available. The market for lumber and labor also greatly favored the southern locations, but the question of climate was of course the deciding factor.

The original Kelly Field, now known as Field No. 1, was leased by the War Department in 1916 and purchased a year later. It is a 600 acre site and located about six miles south-west. of San Antonio, Texas, between the Frio City road and the Southern Pacific and I. & G. N. Railroads, which parallel each other at this point. In April 1917, this field boasted a few miscellaneous buildings noteworthy for their variety, and several long, steel-frame, galvanized iron hangars without floors and with rolling canvas curtains along their long sides. These buildings bear no resemblance to the modern steel hangar which is now standard construction for the army. In June, single-story wooden barracks were constructed for four thousand men, and this field then became the principal concentration and mobilization camp for the non-flying forces of the air service. In December 1917, forty thousand men were encamped here under canvas.

During May and June 1917, the representatives of the Signal Corps, with the



BARRACKS AND HANGARS, KELLY
FIELD, SAN ANTONIO, TEXAS.



BARRACKS AND WIND-VANE, KELLY FIELD,
SAN ANTONIO, TEXAS.

assistance of the San Antonio Chamber of Commerce, arranged for the lease of a fifteen hundred acre site adjacent to Kelly Field No. 1. This land was all quite level with a gentle slope toward the south, where the property is bounded by Leon Creek. On July 17th a contract was let to Stone & Webster of Boston, for the construction of a "Double Unit" flying school to be known as Kelly Field No. 2. This school was destined to become the most important of all the schools in the United States and more pilots received their training at Kelly Field than at any other school in the country.

Stone & Webster also had the contract for constructing Camp Travis, a National Army Cantonment near Fort Sam Houston, on the outskirts of San Antonio. This arrangement eliminated any unfair competition for local material and labor.

There are over one hundred buildings in Kelly Field No. 2, including 24 Hangars, 66-ft.x122-ft.: 12 Barracks, 20-ft.x334-ft., with separate latrine buildings, each 36-ft. square; 12 Mess Halls, 20-ft.x120-ft.; 2 Aero Repair Shops, 66-ft.x202-ft.; 2 Machine Shops, 66-ft.x125-ft.;

2 Garages, 66-ft.x202-ft.; 4 Storehouses, 66-ft.x125-ft.; 2 School Buildings, 96-ft.x200-ft.; 20 six-apartment Officers Quarters, 24-ft.x134-ft.; 2 Dope Houses, 35-ft.x66-ft.; 2 Administration Buildings, 40-ft.x80-ft.; 2 Post Exchange Buildings, 40-ft.x62-ft., and also such buildings as Hospital, Blacksmith Shops, Pump House, Photographic Hut, Officers Individual Houses, Officers Club, Guard Houses, Latrines and Motor-testing Sheds. The cost of this work was approximately two million dollars, which also included a complete sanitary sewer system with modern disposal plant, water works with cast iron distribution mains, over 8 miles of surfaced roads and the preparation of an 800-acre flying field.

The work was commenced on July 25th and on September 10th the first group of barracks and hangars were ready for occupancy, complete with water and sewer connections. The whole job, complete in all details, was formally turned over to the Commanding Officer by the Superintendent of Construction on October 1st. A maximum of 6,000 were employed on the work. No work over 10 hours per day was allowed, but the work was carried on seven days a week.

This field (as were all other flying fields, except those few that were built after March, 1918) was constructed under the jurisdiction of the Construction Division of the Signal Corps, whose enormous activities are little realized at this time. This Division comprised a Construction, Accounting, Traffic, Engineering and Executive Section. The original building plans, which were used on all fields with few modifications, were prepared by Albert Kahn, of Detroit. All engineering work was handled in the field, although later the proper section at Washington assumed the engineering duties to a large extent.

The work at each field was under the immediate charge of a Superintendent of Construction, who functioned like a Constructing Quartermaster. Some of these superintendents were commissioned officers and others were civilians. The superintendent with his

staff of assistants had complete charge of operations, including engineering and the purchasing of materials. To him also reported the Field Auditor, representing the Accounting Section, and the Traffic Manager, representing the Traffic Section.

The contract with Stone & Webster was let on the usual "cost-plus" basis. The contractors, as has been seen, were relieved of a large share of the responsibilities incident to an ordinary construction contract. This arrangement permitted them to devote all their time to the employment and management of labor and the general work of construction in the field.

The layout of the buildings is governed entirely by the long row of hangars, which present a very striking appearance, as, in common with all the rest of the buildings, they are very carefully designed, architecturally as well as structurally. All buildings are covered with novelty siding and painted white, have red slate-coated roofing and either gambrel or hipped roofs. This group of buildings, almost two miles long, standing alone on the Texas plain, with perhaps 150 airplanes lined up before them for inspection, present a no less marvelous sight than some of our more spectacular war activities.

The buildings were located on the long side of the field and so located that an airplane rising at right-angles to the hangars would "take-off" against the prevailing winds. This very important consideration governed locations in all cases. While the hangars are spaced quite far apart, it was soon found that they were not laid out correctly in proportion to the field, as more airplanes could be housed and taken care of in other respects, than could be handled successfully on the field. To secure maximum efficiency from the facilities available, it was necessary to secure greater flying area, and an additional thousand acres was acquired adjacent to the original site and opposite to the rear of the hangars. This arrangement was inconvenient, and it is possible that had conditions been foreseen the number of han-

gars and other buildings would have been reduced, as in a beginners' school considerable flying area is required per plane so that the number of accidents may be reduced to an absolute minimum.

It will be seen from the plan that this field consists of two complete units built from end to end. Many of the fields in the country, especially the later ones, contain only a single unit. Each unit is designed to be complete in itself with all necessary facilities. In actual practice it proved to be more efficient to concentrate all work of a certain class for both units at one point. This applied to both administration and the mechanical departments. The officers' quarters at the extreme ends of the field were originally intended for non-commissioned officers; but when the field was put into use, it was found that the number of commissioned officers was actually greater than had been anticipated, so that the "non-coms" were housed in the barracks. Each unit was designed to accommodate six squadrons of 150 men each, two of these to consist of cadet flyers, and four of mechanics. This arrangement was not in all cases adhered to, as organization changes and work specialization made other arrangements necessary.

Built-up structural members are used exclusively in framing the hangars and other similar buildings. The material for this type of construction is readily available and can be assembled and erected by the ordinary house carpenter. This is an important consideration when the magnitude of the project is considered. To provide the maximum clear space in the hangars, roof trusses of 66-ft. span with no knee braces to the columns were used. The necessary lateral stability is given therefore by outside braces against the posts.

Each post which is 18-ft. high below the lower chord of the truss is made up of four 2x12-in. planks, the two outer planks being separated 2-in. from the inner ones by spacing blocks. The braces consist of two 2x8-in. planks having their ends fitted between the planks of the post and having a 1-in. cover board on the outside. Posts and braces are an-

chored to the concrete foundations by means of stout strap iron "U" anchors. There is a 4-in. concrete floor on a gravel fill, and the floor extends 3-ft. beyond the end of the building. A single expansion joint transversely across the building is used.

The roof trusses have all members composed of pairs of planks. The chords and end-posts have 2x12-in. planks spaced 4-in. apart so that their ends fit between the planks of the posts as noted above. The web members are pairs of 2x8-in. planks, the diagonals fitting between the chord planks, while the verticals are on the outside. The parts are put together with $\frac{7}{8}$ -in. bolts and 40- and 20-penny spikes. For slinging the airplanes $\frac{3}{4}$ -in. eye-bolts are provided in the lower chord. The trusses in the lower twelve hangars were framed in place by the use of false-work, and those on the other twelve hangars were assembled on the ground and hoisted into position by the use of gin-poles and manpower. This latter method proved to be the most rapid and efficient as well as being more economical, and also proved unnecessary to tie up a quantity of lumber in falsework as required by the first method. After the trusses were in place longitudinal struts were bolted against the middle posts. The purlins are 2x8-in. planks, 24-in. on centers, the space between them on the steep slope is blocked solid with 2x8-in. pieces. The roof boards are $\frac{7}{8}$ -in. shiplap, which is covered with a red slate-coated roofing material. Yellow pine is used throughout, and the assumed maximum fibre stress is 1,800-lb. per sq. in. The assumed live load on the roof is 25-lbs. per sq. ft. and 1,000-lbs. on each eye-bolt.

To facilitate the handling of planes the entire cross-sectional area of the building is made available by the use of double pairs of wood rolling doors, 16-ft. 6-in. wide and 18-ft. high. These doors are carried by heavy grooved rollers running on 8-lb. rail securely anchored to the concrete foundation. The rollers have Hyatt roller bearing bushings. The doors are guided by horizontal trunk rollers at the middle and top. To carry

the doors clear of the building, the top and bottom runways extend 16-ft. beyond the end of the building, the top runway being supported at the end by 8x8-in. post supported by 6x6-in. braces on three sides. The lean-to at the back of the hangars is used as a workshop. It was found that rigid end doors could not be built by the use of clinched nails in the boards and it was necessary to resort to the use of screws, which were used freely.

The barracks are long and narrow, of single story construction, and have a row of cots along each wall. For each cot there is a window. A 10-ft. wide porch, partly screened, extends the full length of the building. As originally designed, these barracks were intended to accommodate a full squadron, which consists of 150 men. For each man or cot there was allotted 40 square feet of floor area, and as the building is 10-ft. high from floor to ceiling, this allowed 400 cubic feet per man. Early in 1918, the Medical Department ruled that each man must be allowed 500 cubic feet of air space, and that not more than twenty-five men must



HANGAR AND WIND-VANE, KELLY FIELD, SAN ANTONIO, TEXAS.

sleep in one room. To provide this additional space and also keep the squadrons intact, it was necessary to move the front wall of the barracks to the outside porch line, thus making a building thirty feet wide with three rows of cots instead of two, and the distance between them was consequently increased. The barracks was also divided into six dormitories. The architectural beauty of these very picturesque buildings was ruined, but there is no doubt that more healthful conditions of living were provided for the men.

The frame of these and all similar buildings is of yellow pine and rests on cedar posts which are set on 2x12-in. cypress blocks. The sills and joists are 2x8-in., the studding 2x4-in. and the rafters, which are pitched 30 degrees, are 2x6-in. long—enough to project about two feet over the plate. The roof, side-walls and sub-floor are covered with tongue and groove sheathing or shiplap. The finished floor is 4-in. No. 1 yellow pine flooring, and the side walls on the outside are covered with novelty siding. Tarred building paper is used between the floor boards and under the novelty siding. The exterior is painted white with gray trim, and the roof is covered with red slate-coated ready roofing which is laid horizontally. Cement is used between the laps in such quantity as not to run in warm weather and disfigure the roof. Galvanized roofing nails are driven through both courses and the nail heads are exposed.

The interior is finished with paper surfaced plaster board and is painted with cold-water paint. The ceilings were sprayed, but a brush was used on the side walls. All exterior painting was also applied with a brush, as several spray outfits were tried, but did not prove efficient or economical under the conditions. The yellow pine trim and battens are stained brown before nailing into place. In the early camps the wall-board was run down to the floor and a 4-in. base-board was used. In later construction, however, a wood wainscot about five feet high was used in all buildings. Along each wall there is a continuous shelf above the windows, and also shelves

between the windows at a lower elevation. The result is most pleasing and has a good effect on the behavior of the men, who take much pride in their beautiful quarters.

The latrine building is connected to the barracks by a covered passageway, adjoining which are the barber and tailor shops. The floor is of concrete laid on the ground, which makes a slight incline necessary between the barracks and the latrine. The roof is hipped and comes to point in the center. The walls are covered with beaded ceiling and the ceiling is finished in wall board, both the sides and the ceiling being painted with several coats of white lead and oil. These latrines are steam heated and hot water is also available. The barracks in southern fields, however, are not heated; but stoves were later provided in some instances, as in even our most southerly states heat is required during a portion of the winter. This fact was not appreciated until the cold weather set in, when there was a grand scurry to provide all buildings with stoves, and in many places temporary smoke pipes were put through the windows, which marred the appearance of the building enough to make the designer weep; but then men will be warm and satisfy their aesthetic sense after their bodily comfort has been assured. The plumbing is modern in every respect and the accommodations are very generous; but this is necessary as the soldier does everything at a fixed time, and in the morning or evening when all want a bath at one time, the accommodations do not appear to be more than adequate.

The Mess Hall, Officers' Quarters, Schools, Administration Buildings, Hospital and other buildings are of similar construction as the barracks.

The Officers' Club and Mess contains a single large room, over which the roof is carried on trusses of forty foot span. These trusses are exposed and are built with dressed planks and stained dark oak. Two large brick fireplaces are provided and the room, which is finished in wall-board, is very cheery and inviting. Toilet and kitchen facilities are provided in a wing which extends from the rear

of the main building. A screened porch on three sides of the building adds much to its utility.

The aero repair shops are of the same type of construction as the hangars, except that a 2-in. wood floor laid on sleepers imbedded in a concrete sub-floor is used.

The garages are also similar to the hangars, except that the distance from floor to underside of truss is 14-ft. In later buildings this distance was reduced to 12-ft. The outside braces to the posts were also eliminated and knee braces on the inside were used instead. A well drained concrete floor is provided and all floor drains have especially constructed grease traps to prevent oils from entering the sewer system.

The storehouses have wood floors carried on framing designed to carry a floor load of 250 pounds to the square foot. Both the floor and the unloading platform are at car-floor level. The pitched roof is carried on wood posts which rest on concrete piers.

The machine shops are very light and commodious, and have concrete floors. The roof construction is similar to the storehouses. A mono-rail runs from the machine shop to the testing blocks in the motor testing sheds in the rear of the machine shop. The motor testing shed is provided with cradles to carry motors undergoing repairs, and in the shed adjoining the test blocks are located. These are thoroughly anchored to heavy concrete foundations, and the stands or blocks are of very rigid and heavy construction. They do not rest directly on the concrete, but are separated by blocks of rubber to reduce the tremendous vibration. A separate gravity gasoline system and cooling water piping is installed. These blocks are all served by the mono-rail from the machine shop.

The "dope" building, which is especially light and airy, is provided with a ventilating duct formed in the concrete floor and covered with wood slats. An exhaust fan at each end draws the deadly "dope" fumes from the building.

All other buildings are similar to those described, except the blacksmith shop,

which is of steel construction throughout. This building also has a concrete floor.

The main roads through the camp and cross roads to the garages and storehouses are gravel roads, 18 feet wide, and are surfaced with Tarvia. The road in front of the hangars is water-bound macadam of the same width. The secondary roads and paths are of crushed stone or gravel, with a small proportion of clay for a binder, and were all well puddled and rolled.

The main sewer lines, which are laid with salt-glazed vitrified pipe with cement joints, drain from both ends toward the center, and a 10-inch intercepting sewer, 8,000 feet long, conveys the sanitary sewage to a gravity disposal plant on the banks of Leon Creek. There is very little water in this stream during the dry season and therefore a modern disposal plant was required. This plant consists of a two-compartment Imhoff tank, dosing chamber, sprinkling filter, chlorination plant and sludge bed. The main sewer lines are laid on uniform grades, and all dead ends are provided with flush tanks.

The water supply is obtained from a 10-inch artesian well, about 1,200 feet deep. A steel cylinder about 4 feet in diameter is sunk to the low hydrostatic level of the well, which is about 60 feet below the ground. At this point a deep-well centrifugal pump of the vertical type is installed and is driven by an electric motor on the floor of the pump house directly above the well. The water is pumped into a 112,000-gallon reinforced concrete reservoir, built underground. The water from here is lifted by a motor-driven triplex pump into a 75,000-gallon steel tank on a 135-foot tower—also of steel. This elevated tank proved to be such a serious menace to safe flying that at subsequent fields ground reservoirs and pumps were depended upon for both domestic and fire purposes. The main distribution lines, which are laid to form a loop, are of 6-inch and 8-inch bell and spigot cast iron pipe laid with 5-foot cover. These lines are so designed that repairs can be

made by shutting down only small portions of the system. Over 100 fire hydrants with hose equipment are provided. These hydrants are contained in standard hydrant houses. There is also a central fire station, with chemical and hose carts.

Four 10,000-gallon steel tanks, buried in the ground and thoroughly anchored to concrete foundations, provide gasoline storage for all needs. A motor-driven gasoline pump is located in each of the two garages (near which are also located two of the large storage tanks) to supply gasoline under slight pressure to smaller tanks and gasoline stations on the edge of the flying field opposite the hangars. Standard 5-gallon garage type pumps are installed in small steel houses, from which the gasoline is carried to the planes. In some cases portable gasoline tanks with special filling hose were used to serve the engines and eliminate carrying the gasoline in cans. This resulted in a great saving of gasoline and also of labor.

Electric current for light and power is brought to the field on a pole line along the main road to the field. The 25-cycle current is transmitted at 2,200 volts and stepped down where needed. In the interests of safe flying it was later necessary to dismantle about 8,000 feet of this transmission line to the field and run the wires in lead-covered cable in an underground conduit. All telephone wires throughout the camp are run in lead cable laid in fibre conduit.

To indicate the direction and velocity of the wind to a pilot in the air, "megaphone" weather vanes are located on top of the hangars at the extreme ends of the field. This device consists of a revolving hoop mounted on a staff, and to this hoop is attached a long and narrow linen bag, open at the ends. Ordinary steel-arrow weather vanes are also located on high steel poles in the rear of each administration building.

Among the special features may also be noted an oil reclaiming plant, which is located in a separate building; a machine gun range of the usual construction, and an incinerator located at reason-

able distance from the buildings.

At the time possession was taken of the site, it was covered with 400 acres of mesquite, and the balance was farm land, mostly in cotton. There were also numerous cheap farm buildings and dwellings and some irrigation works, as this section of Texas has very long, dry periods. The mesquite was chopped off below the ground, as it was impossible to draw the roots from the ground in the usual manner. All the cotton was pulled up and burned. The whole field was then harrowed and finally gone over with drags, consisting of split logs and railroad rails. This resulted in a fairly level field for flying operations, but the soil was of such a character that it could not be compacted even by rolling. All flying operations were carried on for some months in a permanent dust cloud, which worked great damage to the equipment and also made living in the camp very uncomfortable. Oiling was suggested as a remedy, but the cost being enormous and the lasting benefits very doubtful. It was also believed that oil would permanently injure the soil if again used for agricultural purposes. On account of the aridity of the region it was impossible to grow grass in the usual way; but finally conditions became so bad that an extensive system of underground water mains was laid over the entire flying field and grass was planted. This to a great extent eliminated the former conditions.

Early in 1918 the wooden hangar was abandoned on future construction, and a steel hangar was adopted as standard for the army both in the United States and abroad. These hangars consisted of a steel frame of similar dimensions as the wood hangars which they superseded. The roof and sides were covered with corrugated iron, and steel sash were used. Such hangars could be dismantled and re-erected in a very short time. With solid ends, these buildings were also used in some cases as machine shops and storehouses.

It will be seen from the foregoing description that the Flying Schools in the United States are of more or less permanent construction; and as the army is

unable to utilize all of them for training purposes, their ultimate disposition is a very interesting problem. By eliminating the hangars from consideration we have an ideal group of buildings for military or other training purposes.



MODERN INDUSTRIAL PLANTS



By George C. Nimmons

Part VI-b

THE EXCESSIVE TURNOVER OF LABOR AND THE INFLUENCE OF EMPLOYEES' WELFARE WORK IN REDUCING IT.

A COMPLETE remedy for labor fluctuation is a most difficult and far-reaching problem to solve. Much is being written about it and a great deal of consideration is now being given to it.

The problem seems to divide itself directly into two parts: First, how to get the right man for the right place; and, second, how to keep him in that place when he has once proven himself to be adapted to it.

The problem of how to get the right man in the right place seems, from the investigation, not to have been given the importance in the past which it merits. Reports and statistics all showed that those concerns which had no employment departments had the largest turnover of labor; and the authorities also agreed that, as a rule, those plants which did have employment bureaus failed to put them under control of men with as much ability as the importance of the positions warranted; nor had such departments generally been developed or organized in any degree up to the limit of their possibilities and opportunities. Whole books and pamphlets have been written on this subject alone, and a concerted effort is being made to stir up the heads of industries to a realization of the importance of getting the right men for each job and then getting them started properly at their work.

A great deal of attention is being directed to apprenticeships for boys and girls and specialized technical training for adults. And when it is found that it is difficult to get employees for some

kinds of positions, and it is impossible to alter the character of such positions so as to adapt them better to the personal characteristics of the employees, this also is being attended to.

It has been found also that much can be accomplished by well-directed efforts to regulate and systematize commercial demands so as to bring about a more uniform production throughout the year, thereby avoiding reduced production in certain seasons. Among other things which federal control and supervision of the industries has brought to light is the absurd number of varieties manufactured of many articles in common use. Pen-knives, for instance, are made in hundreds of different styles whose variety adds no value to them. On the contrary, these numerous styles only interfere with manufacturing extra supplies in dull seasons of the year. It has been found that many things can be more standardized and reduced in varieties and styles, thereby saving the needless tying up of capital in unnecessary stock and at the same time giving the manufacturer a better opportunity to run his factory in dull periods, making up extra supplies of these standardized products. This, of course, would be a great help to giving steady and constant employment to workmen in the factories.

This article, however, is not concerned so much with the methods and reforms involved in selecting the right man for the right job as it is with keeping him in that job after he has got it. Of course, after he has it, a great deal depends on his control and treatment by the factory



EMPLOYEES' CLUBHOUSE, UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.

management as to whether or not he keeps it. But this article, in connection with "Modern Industrial Plants," has to do properly with those features of the buildings and their surroundings which tend to make the employee want to work there and stay there.

It is now recognized by industrial authorities, generally, that the policy formally adopted by some, of considerate, kindly and generous treatment of employees, can no longer be regarded as a voluntary philanthropic movement, but as a policy essential for the reduction of the excessive turnover of labor.

The result of the adoption of such policy at industrial plants has been the creation of what is now commonly called welfare work for employees, and welfare work is now regarded as one of the chief means of overcoming the excessive fluctuation of labor.

Welfare work may be broadly defined as the result of efforts on the part of employers to make their workers satisfied, contented and happy, and to improve their condition physically, intellectually, economically or socially.

Some of the principal ways in which welfare work manifests itself are as follows:

1. Convenient and wholesome locations for the buildings.
2. Improved grounds around buildings and landscaped where possible by the planting of lawns, flowers, trees and shrubs.
3. Buildings architecturally designed to express their purpose or business, and made as attractive or beautiful as circumstances permit.
4. *Working conditions.*

Workshops perfectly adapted to the work.

Proper heating, ventilating and lighting.

Convenient and adequate stairways, elevators and communications.

Complete health provisions and safety devices.

Modern sanitary lockers, coat rooms, lavatories, toilets and baths as required by occupations.

5. *Food and lunching facilities.*

Lunchrooms, including a place

for those who bring their lunches from home.
Dining rooms, cafeterias and restaurants.

Sanitary kitchens and wholesome food.

6. *Recreation and entertainment.*

Outdoor athletic fields, playgrounds, walks and gardens.

Indoor recreation rooms.

Rest rooms and smoking rooms.

Gymnasiums; athletics; field days.

Country Clubs.

Gardening; competitions in the raising of flowers and vegetables.

Music and concerts.

7. *Health and Sickness.*

Rest periods; pauses in the work; vacations.

Medical supervision: physicians and nurses.

Hospitals.

Emergency rooms.

First aid.

Dental departments.

8. *Education.*

Libraries.

Literary clubs and societies.

Boys' and girls' schools; apprenticeships.

Classes in advanced technical training.

Classes in general education.

The industrial arts: teaching of the foundation principles that underlie good construction and beautiful design.

9. *Economic measures.*

Profit sharing, bonuses and premiums.

Insurance: accident and life.

Family benefits for death and sickness.

Old age pensions.



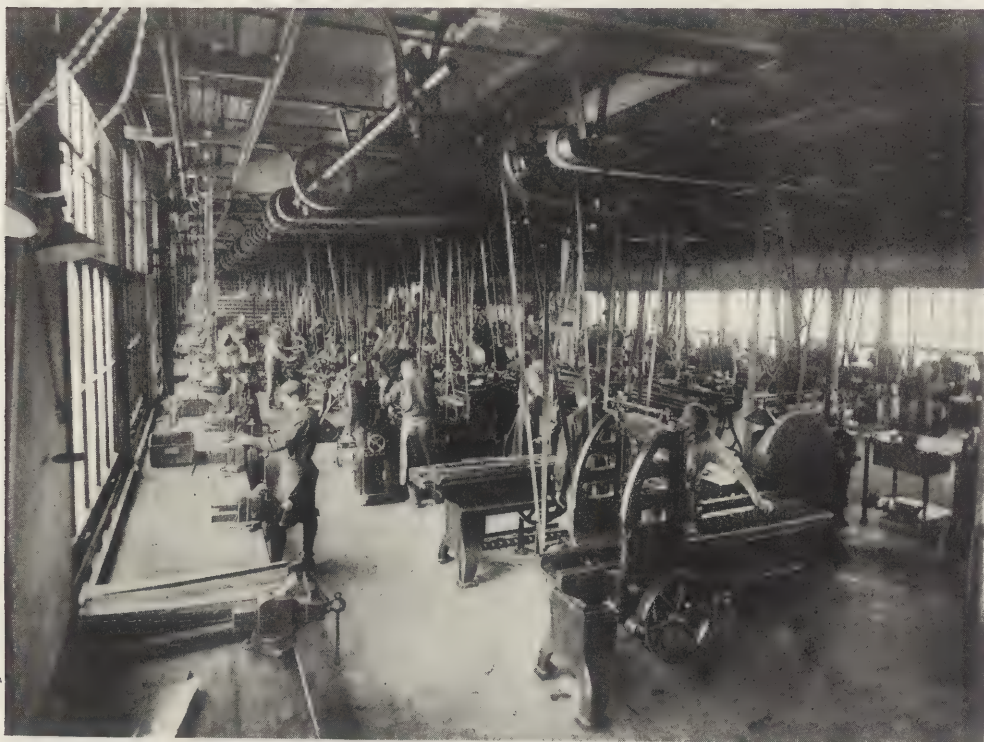
DRAFTING CLASS, INDUSTRIAL SCHOOL, FACTORY OF UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.



BOWLING ALLEYS, UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.



DANCING AND ASSEMBLY HALL, UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.



MACHINE CLASS, INDUSTRIAL SCHOOL, FACTORY OF UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.

10. *Housing.*

Model homes for employees.

Industrial villages, with complete provision for community and social life.

The above outline and the divisions into which this subject falls indicate the far-reaching manner in which its branches extend out into this vast field of work. There may be other branches which should be included, but the above list is a summary of the principal welfare work which is to be found at the present time in the different industries all over the country. Some concerns have made a specialty of certain branches of the work, and there is probably no single firm which provides for all the items mentioned. The character of the plant and class of work done is what really determines the kind of welfare work most useful and appropriate in each case.

Strange as it may seem, the trade unions at first generally opposed welfare

work. Their chief opposition to it was founded on the claim that welfare work was often substituted for an advance in wages, and that it was utilized as a means to prevent the organizing or unionizing of the employees. They recognized the tendency of such work to make workmen more loyal to their employer than to the labor organizations. There were several noted instances, one in a mining community and one in a large agricultural plant, where welfare work had been developed to such an extent and given rise to such friendly and loyal relations between workmen and their employers that the employees refused to strike when workmen in similar plants went out on a strike in their vicinity. Opposition to welfare work by organized labor grew to be quite hostile at one time, but lately and especially during the war period this opposition seems to have disappeared. In spite of this opposition, the development of welfare work among the industries has

steadily increased and now it appears that the workmen very generally appreciate it, and regard it as nothing more than what is due them under the circumstances. It is undoubtedly true that with their increased control of the labor situation, they no longer fear any interference in their rights or undertakings from the influence of welfare work.

In the consideration of welfare work it is difficult in some instances to draw the line between what is absolutely essential for the manufacture of the product and what may be instituted for the welfare of the workers. It might be considered that nothing should be classed as welfare work which has a stronger reason for its existence among the essentials for production, such, for instance, as some of the working conditions in the factory. But there should be no quarrel over such a situation, even if some welfare work does overlap into the field of production essentials; because, after all, all welfare work has for one of its objects better and greater production. It

should be frankly admitted, in the first place, that it is in no sense charity; and is not paternalistic in character, but something that benefits equally the worker and his employer.

LOCATION, GROUNDS, BUILDINGS.

The first three classes of welfare work have to do with the exterior of the buildings, their location and the treatment of the space or ground around them.

If industrial production were altogether disconnected from the human and personal element, and if it were entirely a mechanical proposition, then nothing would be needed for the purpose but strictly utilitarian boxlike buildings, to contain the machinery and materials. But the human element in production is the feature which now calls for more consideration and more wise provision than all the machinery combined.

When it is remembered that the factory is the place where the workman spends a good part of his life, and when it is realized that it is difficult, if not



LUNCH ROOM, UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.



HOSPITAL FOR EMPLOYEES, UNITED SHOE MACHINERY COMPANY, BEVERLY, MASS.

practically impossible, to create in a high class self-respecting craftsman or mechanic a feeling of loyalty and personal interest in an establishment that in its appearance is unattractive, needlessly dirty, poorly kept, overcrowded, unwholesome and repellent, then this question of attractive buildings and their surroundings becomes of importance. Particularly is this true now since the leading authorities agree that the best solution of our present industrial difficulties is to be made only by appealing to the laborer with measures which he will recognize as beneficial to him as well as to the employer.

Of course, manufacturing buildings and their surroundings that are designed and built strictly along scientific and utilitarian lines have no attraction whatever in their appearance as a rule, and perhaps the only effect they have on a person is to create in him a desire to get away from them. The people in the better parts of towns or cities always oppose the location of factories in their

midst. Therefore no workman employed in such concerns could ever have any pride or satisfaction in the appearance of the buildings and their surroundings.

On the other hand, buildings that are designed with the expressed object in view of making them look neat, interesting, expressive of the use to which they are put, attractive in construction and detail and sometimes even beautiful without being elaborate or expensive, are always objects that appeal to every one. The influence of good architecture is as old as the building art, and there is no question but that attractive buildings—and particularly if their surroundings can be landscaped a bit with flowers, lawns and trees—are surely going to appeal to the workman, and make it easier to win his loyalty if the other conditions are right. There are plants, of course, such as those connected with some of the large steel or metal industries, where the smoke, gases and nature of the buildings appear to make attractive effects dif-

ficult to attain. Yet, as a matter of fact, few of them have ever tried it out, but those which have seem to have succeeded very well. It is astonishing what can be done often without material increase of expense, in making the most unpromising, smoky industry attractive in many ways. As a rule much of the smoke and objectionable gases that are now discharged into the sky could be largely dissipated or used to some good purpose if proper appliances were installed. Most of the rubbish and dirt could be made to disappear, and a great deal of the grounds around such plants could be converted into neat, useful and often attractive surroundings, aside from the opportunities often available for replacing some of their flimsy, rapidly decaying buildings by substantial and attractive structures.

The chief advantages to an industrial

plant of attractive buildings and grounds are their advertising value, their important effect in raising the whole character of the community or city in which they are located, the pleasure and satisfaction they give the owner and the strong and valuable influence which they at all times exert upon the employees. The last item is now the most important of all, and wherever attractive buildings and improved grounds will aid materially to reduce labor turnover, they will be a good and wise investment for this one reason alone, although their cost is not nearly as great as it is commonly supposed to be.

Efforts to make industrial plants attractive are steadily increasing all over the country and their results vary all the way from a few window boxes filled with flowers to the suburban plant with beautiful buildings and extensive grounds

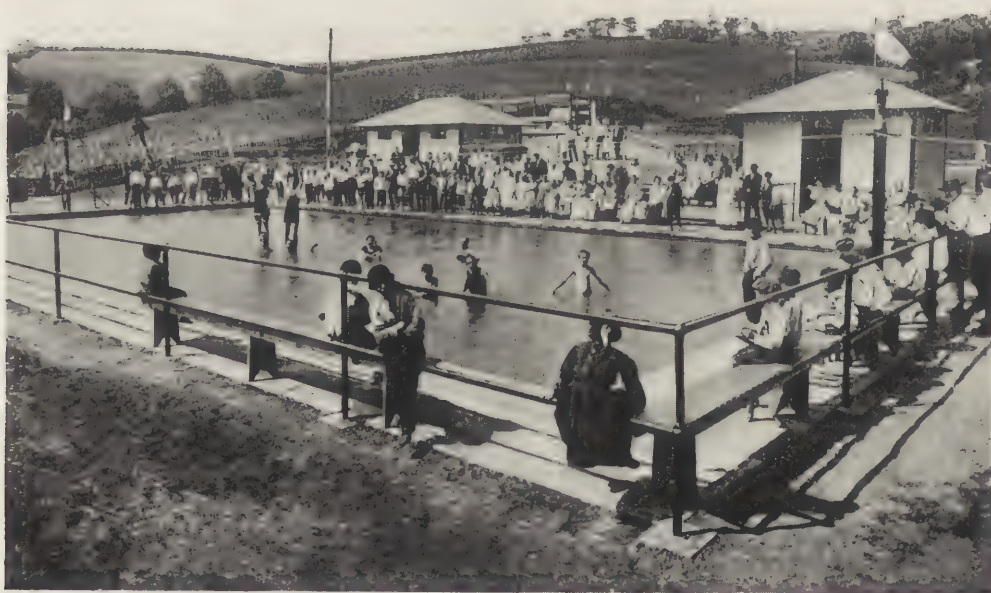


MACHINE SEWING ROOM OF THE PRINTZ-BIEDERMAN COMPANY OF CLEVELAND, OHIO.
—WHERE THE LIGHT IS THROWN DIRECTLY DOWN ON THE WORK.

Courtesy of the Welsbach Company.



AN INDOOR SWIMMING POOL FOR EMPLOYEES, INSTALLED BY THE STANDARD
SANITARY MANUFACTURING COMPANY.



THE OUTDOOR SWIMMING POOL FOR EMPLOYEES, INSTALLED BY THE STANDARD
SANITARY MANUFACTURING COMPANY.



SWIMMING POOL FOR EMPLOYEES, ARMOUR AND COMPANY, CHICAGO, ILL.



MUSCULAR DEVELOPMENT AND CORRECTION OF PHYSICAL WEAKNESSES UNDER PHYSICAL DIRECTOR AT ARMOUR AND COMPANY'S PLANT, CHICAGO, ILL.



GYMNASIUM BUILDING FOR EMPLOYEES, ARMOUR AND COMPANY, CHICAGO, ILL.

landscaped and provided with all sorts of outdoor recreation and play grounds. The small or medium-sized plants also have often been made very attractive in a simple way by having their buildings well designed, and setting them back sufficiently from their front lot lines, to provide room for a foreground or small park of lawn, walks, flowers and trees.

The effect of these things upon the average workman is just like the effect of these things around a home or in a park. People have always created them for the express purpose of giving pleasure and making the place where they exist attractive.

So, in the case of a factory, the object of such improvements, so far as the workman is concerned, is to give him pleasure and enjoyment by seeing these things when he comes to work in the morning; of enjoying them at the lunch hour to-

gether with the walks, the flowers, the games and the recreations; and then again at closing time, taking away a pleasant last impression of the place before he goes home. Human nature makes plain to everyone the effect of such experiences of life. Every wholesome enjoyment and pleasure is an uplift to the normal person, and an incentive to make him work the better so as to enjoy the pleasures of life all the more. Life after all must be worth the living or else labor will be nothing but a drudgery. So that what better place could there be of cheering up and brightening the life of the workman than his workshop or the place where he spends the most of his life? And there is this satisfaction about the influence and effect of such surroundings, that, if they are really beautiful, their good effect will be just as permanent

as the attraction of the flowers that grow along the walk.

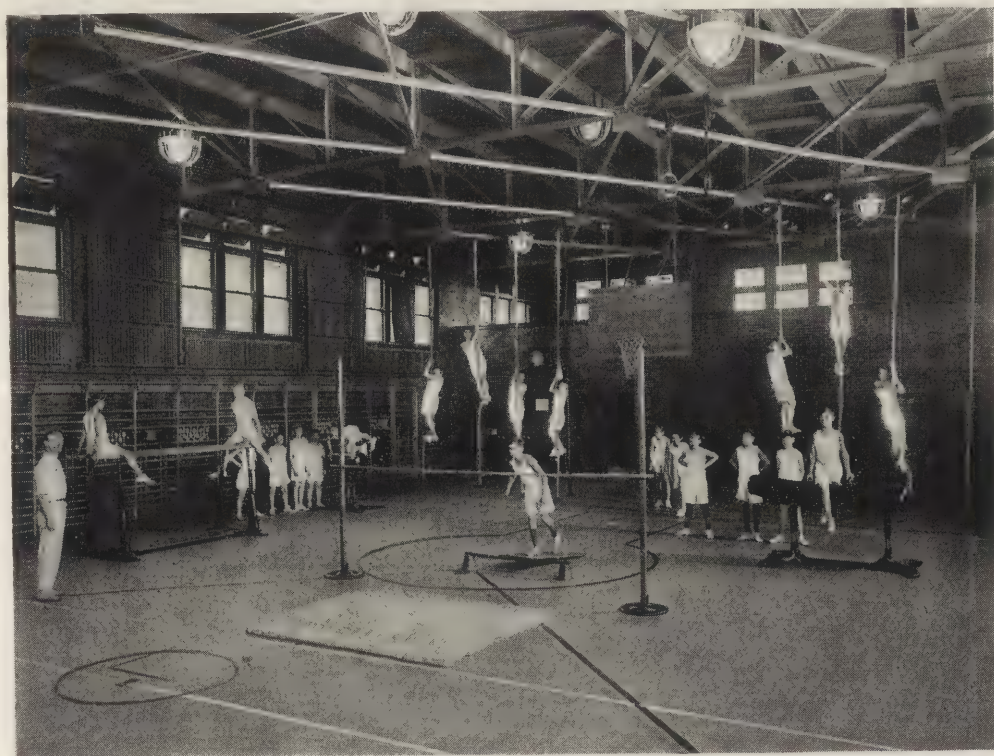
WORKING CONDITIONS.

The fourth division of welfare work refers to all those provisions on the interior of the building which tend to make good and efficient workmen. The first essential for making the work interesting is to have a proper workshop, well equipped and well adapted to the work to be done. No workman can do his full share of work or do his best in performing it unless he has an interest in it. To create a full interest in the work, conditions must all be favorable, and workmen should not be annoyed or made to suffer discomfort by the lack of any essential for this purpose. When the workman arrives at the plant he should have a proper sanitary locker with room to dress or put on his overalls. Stairways and elevators should give him convenient access to his working place; his bench or

machine should be well placed with plenty of room; good light, either natural or artificial, should be thrown not in his eyes, but on the work; the heating and ventilating apparatus should make him comfortable in all seasons, and furnish him at all times with clean fresh air to breathe. Wherever he goes about his work reasonable safeguards and protection should be provided to save him from accidents or injury. Drinking fountains, lavatories and toilet rooms should all be adequate and sanitary in every respect.

FOOD AND LUNCHING FACILITIES.

When lunch time comes, workers should be prohibited from eating at the place where they work and in some localities this is the municipal or state law. Some concerns believe that it is decidedly beneficial for them to lunch outside of the building in which they work, and have provided separate dining and restaurant buildings accordingly. At



INTERIOR OF GYMNASIUM BUILDING OF EMPLOYEES, ARMOUR AND COMPANY, CHICAGO, ILL.



INTERIOR OF GYMNASIUM FOR EMPLOYEES, ARMOUR AND COMPANY, CHICAGO, ILL.

any rate suitable and clean rooms in which to eat, with sanitary modern kitchens and nourishing and wholesome food, are now considered essential and are very generally provided for by the American industries. Some establishments have made a feature of this kind of welfare work and provided most extensive and attractive restaurants and cafes, often with good music and other entertainment combined. In large plants there are usually several kinds of places to eat: private dining rooms or cafes for the firm and heads of departments, visitors' restaurants, and then two or three kinds of places for the various kinds of employees, such as lunch counters, table d' hote restaurants and cafeterias. The cafeterias seem to have proven to be the most practical and popular for the average employee, on account of the quick service and the lower cost occasioned by the absence of waiters to serve the meals.

It seems also to have become a uni-

versal custom to charge the employees for their meals only what they cost.

RECREATION AND ENTERTAINMENTS.

Provision has often been made by plants for recreation both indoors and out. Rest rooms, smoking rooms, and gymnasiums are often provided where calisthenics, athletic exercise and training for field sports are carried on, sometimes under the direction of an athletic trainer. Tennis and baseball are the favorite sports for the noon hour; while in some few instances country clubs are maintained for employees, who use them for golf and other sports on holidays and times after work hours. Gardening has been instituted by some and encouraged particularly around the homes of the workers, and prizes or premiums are frequently given for the best results in raising flowers and vegetables. This has proven to be one of the most beneficial and wholesome occupations and has the added advantage of beautifying the

homes and providing fresh vegetables for the home table. The organization of orchestras and singing societies has also led to a great deal of very attractive entertainment in the way of concerts, dances and musicales among the employees.

HEALTH AND SICKNESS.

There are probably few departments in industrial plants that have progressed as far as those in charge of the health of employees. This is because the physicians and surgeons have freely given all that modern science could offer to the development of such departments. It is quite common to find a registered nurse in charge of a department which takes care of those who fall ill or are injured, and in many cases there may be a physician with assistants, a whole corps of nurses and a dental department as well.

Hospitals are provided that range in size and importance from a corner of a room with a cabinet of bandages, medicines and a first aid kit, up to tile lined, fully equipped sanitary hospitals, with consultation rooms, examining rooms, operating rooms, and fully equipped ambulances operated exclusively for the employees.

Employees in some plants are taken better care of than most men in almost any other walk of life. Records have been kept of headaches and other minor ailments in old-time buildings where old-time methods were in force and compared with those compiled in modern up-to-date plants with all the sanitary and health promoting advantages, and the results show a wonderful improvement and a great diminution in human suffering and physical ailments in the plants where this kind of welfare work is properly carried on.



GIRLS' DINING ROOM OF THE SHREDDED WHEAT COMPANY PLANT AT NIAGARA FALLS, NEW YORK.



GIRLS' REST ROOM OF THE SHREDDED WHEAT COMPANY PLANT, AT NIAGARA FALLS, NEW YORK.

EDUCATION.

Many plants have provided libraries with a good selection of books, and many of the magazines and publications that would likely be most interesting and useful. Literary clubs and societies have in some cases been formed where the knowledge of interesting subjects is acquired and where many of the problems of the day are debated.

Boys' and girls' schools, apprenticeships and advanced technical training are maintained and given by some plants and great assistance is afforded in this way to those who seek to improve their store of knowledge and prepare themselves for advancement. The greatest need for instruction, however, at this time, is by all odds the need for instruction in the industrial arts. If there is anything in which American products are inferior in many instances to those of Europe, it is in their design; and it would therefore

be a most excellent thing for almost every concern which produces any material thing that has to be designed with ornament on it, to start an industrial art school which everyone should attend, including particularly the boss of the concern and all of his assistants—who need it, as a rule, more than anyone else.

ECONOMIC MEASURES.

The chief connecting link in the relations between the employer and his employees is the wage which he pays them. The minimum rate paid by each industry is usually an amount which has been fixed and agreed upon by the combined action of the employers and employees' organizations. In additions to these regular rates of pay, efforts have been made from time to time by various employers to reward deserving employees with additional remuneration and benefits in the way of profit sharing, bonuses, premiums, pensions and insurance. It has long

been recognized that the young, capable and ambitious employees, who exhibit a growing and promising ability and who manifest a sincere interest in their work and in the interests of their employers, are bound sooner or later to demand for themselves fair opportunities at least for larger remuneration and a better future than the regular salary and conditions that their positions provide. In order, therefore, to provide a means that may satisfy the ambitions of such employees, who are really the men from among whom the leaders usually develop, this system of profit sharing, bonuses, etc., has been adopted by many concerns. Profit sharing has not always been successful, however, and there are firms who have tried it and failed to accomplish the desired results. Authorities seem to agree that these instances of failure have been due to the indiscriminate payment of these extra benefits to all the employees of a plant, including the

lazy and undeserving ones. Their claim is that profit sharing can only be successful when it is paid exclusively to those employees who deserve it by having really helped to earn the extra profits which make profit sharing possible.

The plan of paying bonuses on the sole basis of increased production has its limitations also. When production is speeded up by any one of the slapdash methods that are likely to result from some of the feverish, strenuous and spectacular sayings and writings of the present day on industrial production, the result is very likely to bring ruination of quality for the sake of quantity production, and also premature wearing out of the nerves and strength of the workman. Speed, of course, is vital in competitive industry, but it is not by any means to be secured at the expense of quality or the health and ability of the worker. Speed bonuses or piece work must therefore be watched



AUDITORIUM OF THE SHREDDED WHEAT COMPANY PLANT, AT NIAGARA FALLS, NEW YORK.



OFFICERS' DINING ROOM, PIERCE-ARROW MOTOR CAR COMPANY, DETROIT, MICHIGAN.

carefully or they will result in defeating their own ends. This they have done in some noted cases, and consequently have been abandoned.

After workmen have married and settled down in their homes with their families, the question of providing in some way for their families in case of accident, sickness and death becomes of paramount importance. Although the state compensation laws provide now very generally for some of these emergencies, still a great many concerns in this country and very generally in Europe maintain systems for the payment of benefits, pensions and insurance to employees.

The payment of premiums or dues by employees for such purposes are sometimes made compulsory and the required amounts are deducted from the wages, while in other instances they are voluntary. Some concerns pay a proportion of such benefits and other firms have

large sums set aside, the income of which is used exclusively for the payment of old age pensions and benefits of various kinds.

HOUSING.

There is no feature of industry that received more consideration or caused more action to be taken during the war than housing for employees. This came about from the example set by the British Government in providing housing for the ammunition and war supply workers in England. At the beginning of the war the British Government was obliged to enlarge its war supply industries materially, and also to supply whole new villages or communities in which the workers could live. The experience in England with labor had already clearly demonstrated before the war that homes for workers could not possibly be handled by the speculative builder and at the same time assure the things vital and essential for peace and



KITCHEN AT THE MAIN PLANT OF THE PIERCE-ARROW MOTOR CAR COMPANY,
DETROIT, MICHIGAN.

contentment among the workers. Mere shelters or poorly planned, unattractive houses, crowded together in a subdivision with nothing more than streets and sidewalks giving access to them, with high prices for the land and buildings, had already proven to the satisfaction of the British Government, from investigations formerly made, that such things were the real causes back of discontent, strikes, excessive labor turnover and fatal epidemics. In other words, proper workmen's villages could no longer be money-making propositions for any private interests, but on the contrary must have help from the Government in the form of long-time loans at low interest and low prices for the land. They must also above all include not only the strictly utilitary things, but the attractive and wholesome features commonly ascribed in this country only to model villages, such as well planned sunny

houses, parks, playgrounds, amusement, entertainment, educational buildings, and all such things which were found to be really essential in making the worker and his entire family happy and contented.

What was remarkable about the whole undertaking at that time was the fact that England, at war, bombarded by zeppelins and airplanes, threatened with foreign invasion, was yet at such a time ready and able to bother about model villages. Any one would naturally suppose that this was no time even to consider anything but mere shelters with the bare necessities of life. And yet the British Government was so convinced of the futility of getting proper production of ammunition with the workers housed in shacks and tenement-like dwellings, that it did not hesitate at all to adopt and carry out the policy of model workmen's villages, with the conviction of thereby getting maximum relief from the

excessive turnover of labor, strikes, and all the other labor difficulties which were imminent at that time.

In spite of the most unfavorable conditions of the time, the model villages quickly erected in England set a new and higher standard for workmen's homes than any which had existed before.

In October, 1917, Mr. Frederick L. Ackerman, Architect, visited England, inspected and studied these new villages and came back to this country with illustrations, drawings and complete information of what had been done in this respect. A full report of this visit with illustrations was published in the *Journal of the American Institute of Architects*. The publication of this report stirred up a lively interest in the subject all over this country and undoubtedly influenced our own Government in deciding soon after to follow England's lead in building model villages for our own workers, who were greatly in need of housing accommodations. One hundred million dollars were appropriated, a very competent organization was formed under the control of the United States Housing Corporation of the Department of Labor, and over ninety different housing projects, ranging in size from villages of one hundred to two thousand houses, were begun, and sixty of them put under contract for construction before the armistice was signed. After this, fifty-six of the projects were canceled, twenty-two were allowed to go ahead, and fifteen were diminished in size, thus leaving thirty-seven of these villages, which it is hoped will all be completed as planned.

The Senate passed a sweeping resolution requiring that the work on all projects not seventy-five per cent. complete should cease, notwithstanding the fact that great numbers of the houses were caught in a condition partly done, where they will go to rack and ruin rapidly. The attitude of the Senate when the matter came up seemed to be most unfriendly, as severe criticisms of the whole undertaking were made. Resolutions were also offered at the Atlantic City convention of the Association of Commerce favoring abandonment by the Government of the whole housing project.

Why the Senate or any one else could fail to profit by England's experience, and why, if these model villages were good for the workers in war times, they should not be all the better in peace times is hard to understand, particularly when one of the most perplexing, if not the most serious, of problems now in this country is the labor problem.

Unquestionably the Government should go on with these villages (especially the ones already partly constructed), complete them and then develop and assist such undertakings, form proper laws as England has done to control and protect them, for the sake of the great masses of industrial workers in this country, and in this way help to build up a precedent of this standard for housing workers, that is in itself the strongest known influence at this time for stabilizing labor and winning its loyalty and support.

In a general way the outstanding features that may be of particular interest concerning these new model villages are as follows:

There is no preconceived set plan for the arrangement of any of them; that is entirely determined in each case, first by the character of the site, and then the various other requirements growing out of the particular industry in question. The communicating streets or avenues may be straight or curved according to whichever kind would be the most practical, cause the least grade and fill, and accomplish their purpose in the best and most interesting manner. The lots are laid out so as to give the greatest number of houses consistent with good light and air. The houses are mostly grouped together, double, triple or even up to six or eight in a row, and there may be occasional single houses. Houses at the corners may be set at an angle to widen the view and road at the turns, or the houses may be placed in any one of many arrangements that might utilize the ground to the best of advantage, preserve trees or other landscape effects that already exist or open up some view of particular attractiveness. The planning, arrangement of the rooms, and the design of these houses are as a rule the

best that have ever been made, as they are the result of the highest talent among the architects of this country and England. Among other things, they are not built with all the different kinds of brick and building materials in the market, nor is each one in a different style of architecture, clashing and detracting from one another as they do in the typical old subdivision; but they are all harmonious with each other in design and material, every one possessing its own individuality and contributing and adding to the effect of the whole. No money is spent on useless ornament, but beauty and charm of effect is secured by proportions, balancing of the parts of different groups, pleasing variations in the design of the buildings and their materials, the attractions of the different kinds of porches, the home-like, restful appearance everywhere and the telling effects of the simple landscape treatment.

One of the most important features of such villages is that the shops and markets are made just as attractive in their way as the houses. The community centers, with their schools, churches, places for entertainment and amusement, are all planned and treated in such a way that, no matter where you go, you are confronted with the same harmonious, simple, practical and pleasing handling of the problem.

These housing projects, therefore, should be comprehended not as overdone, extravagant places, where money has been wasted by striving to make them beautiful, but, on the contrary, as places made beautiful by applying art in a simple, inexpensive way to the working out of the absolutely essential and practical needs of those workers who are to occupy them.

There are probably few people in the world who have had so exceptional an opportunity to observe the need for such villages, to analyze their effect upon the workman, and to judge of their real value, as David Lloyd George, Prime Minister of England. In speaking of the introduction of welfare work for employees into industrial plants, he said: "I cannot insist too strongly on the

importance of the movement. It helps to secure a larger and speedier output of munitions; it preserves the health and happiness of the workers, and it relieves the harassed employer of needless strain. It is a strange irony, but no small compensation, that the making of weapons of destruction should afford the occasion to humanize industry. Yet such is the case. Old prejudices have vanished, new ideas are abroad; employers and workers, the public and the state, are all favorable to new methods. It may well be that, when the tumult of the war is a distant echo, and the making of munitions a nightmare of the past, the effort now being made to soften asperities, to secure the welfare of the workers, and to build a bridge of sympathy and understanding between employer and employed, will have left results of permanent and enduring value to the workers, to the nation and to mankind at large."

In conclusion, it seems important to call attention again to the fact that one of the most important and promising agencies in reducing the present excessive and ruinous turnover of labor is to continue and develop the entire field of welfare work, which has been already so well started and carried on by some of the industrial plants of the country.

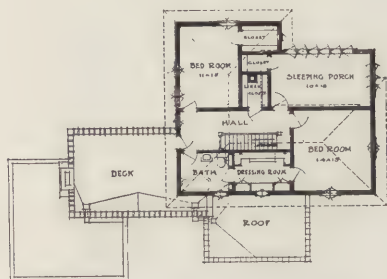
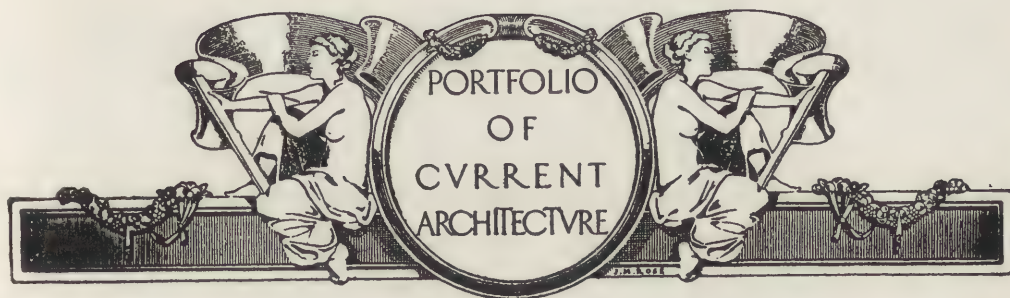
Welfare work is unique in its ultimate effect and benefits, as compared with the improvements and betterments adopted in the past by different concerns in industry to get ahead of their competitors. Whenever improved machinery or new processes adopted by enterprising plants became generally or universally used, which was nearly always the case, then the competitive value of such improvements entirely disappeared; while with welfare work the ultimate effect is entirely different.

A firm which maintains the most complete system of welfare work may be closed by a sympathetic strike which really originated from causes growing out of the lack of welfare work at the plant of one or more of its competitors. Likewise the discontent of employees at plants where they are treated badly may

result in the adoption by the labor organizations of rules and regulations that will work hardships on the model industrial plant as well as upon the objectionable one, so that the complete benefits of welfare work cannot be gained until it is generally adopted. When it is generally adopted its competitive value would not change materially from what it is now, except in regard to reducing labor turnover at each plant where welfare work had been installed; but all the other benefits which result from a contented labor body cannot come to any great extent until welfare work has been generally adopted. So that welfare work universally adopted will tend to lift all indus-

tries out of a bad situation prevailing now with labor, into a new condition where labor will be more contented, more efficient, more reasonable and above all more loyal to the firms by whom the workers are employed.

In addition to this the great benefits which come to every community and every city where the industries maintain complete welfare provisions for their employees are added reasons why it should grow and become universal. For after all in this country, where industry is the chief pursuit, it is only with contented, healthy, efficient, loyal and happy workmen that the nation can prosper and attain the high goal of its aims and ambition.



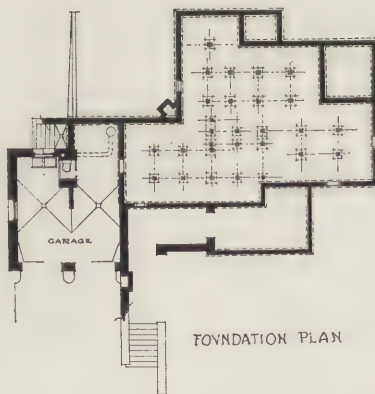
SECOND FLOOR PLAN

RESIDENCE
FOR
HARRY A. SMITH
THE RIVIERA
SANTA BARBARA CALIF.

Roland F. Sauter
1911



FIRST FLOOR PLAN



FOUNDAION PLAN

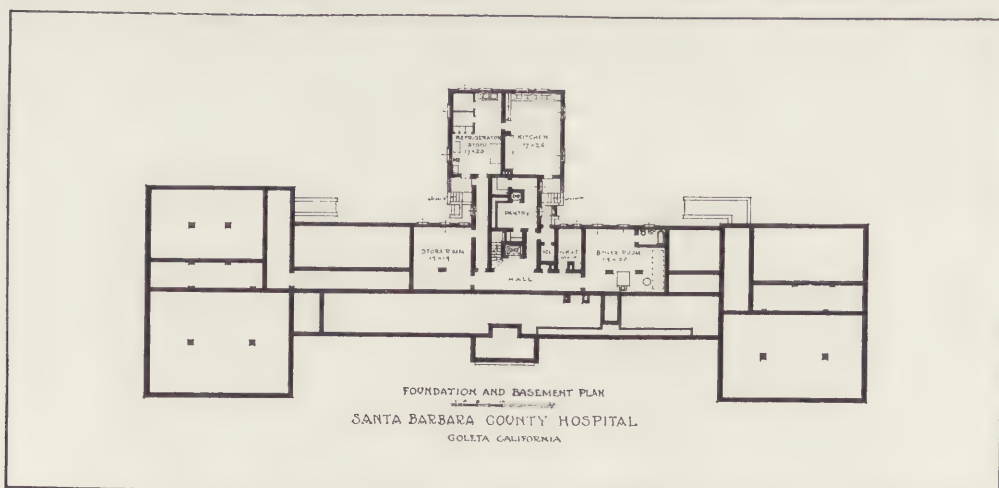
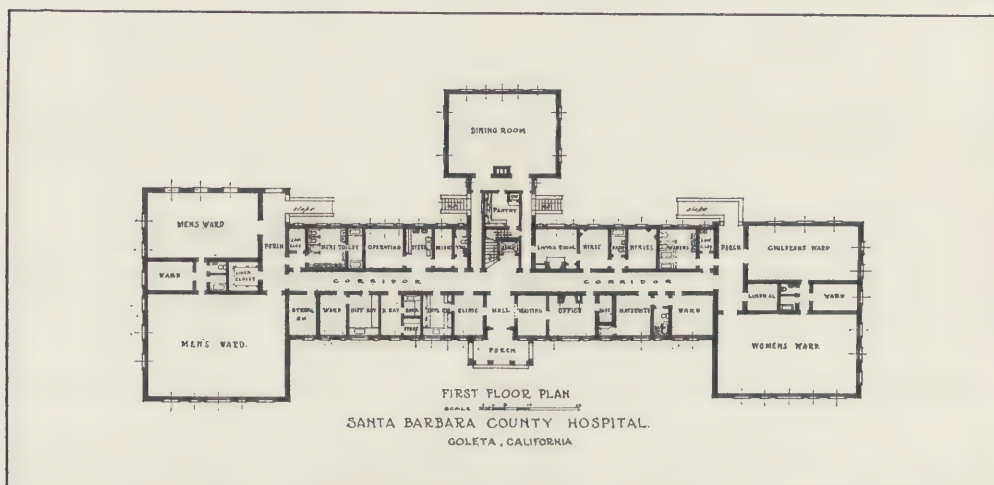
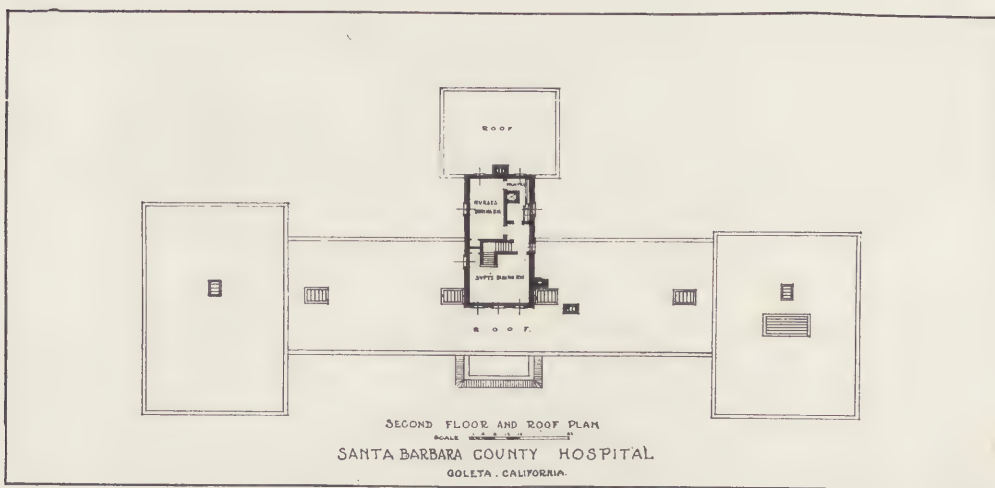
PLANS—RESIDENCE OF HARRY A. SMITH,
ESQ., THE RIVIERA, SANTA BARBARA, CALI-
FORNIA. ROLAND F. SAUTER, ARCHITECT.



RESIDENCE OF HARRY A. SMITH, ESQ.,
THE RIVIERA, SANTA BARBARA, CALI-
FORNIA. ROLAND F. SAUTER, ARCHITECT.



RESIDENCE OF HARRY A. SMITH, ESQ.,
THE RIVIERA, SANTA BARBARA, CALI-
FORNIA. ROLAND F. SAUTER, ARCHITECT.



Roland F. Sauter, Architect.



SANTA BARBARA COUNTY HOSPITAL, GOLETA,
CALIFORNIA. ROLAND F. SAUTER, ARCHITECT.

NOTES AND COMMENTS

Some Landmarks of Dutchess County.

There were two reasons why I wished to look up the remains of early settlements in the Hudson Valley. I had made a special study of the early history of New York State, and there were such contradictory opinions as to the merits and importance of Dutch Colonial architecture that my curiosity concerning it was aroused.

Planning my expedition with the aid of a map, I decided on Poughkeepsie as my first destination, for it is a central location, being about half way between New York and Albany.

Of course, I was anxious to be in or near the oldest section of the city, and luck guided me to Cannon street, which, as a history of Poughkeepsie obtained at the library informed me, was the first street of the town to be laid out. This local history also gave the information that the Albany Post Road, disguised under the names of Market and Washington streets, was only two blocks away.

This all-important Albany Road had de-



END VIEW, SHOWING SMALL EARLIER HOUSE
IN REAR—MESIER HOUSE, WAPPINGERS
FALLS. BUILT ABOUT 1742.



OVERMANTEL WITH PICTURE PANELS IN
MESIER HOUSE.

termined the location of the town almost two miles back from the river—perhaps, though, that is too much to assume for the first mill of the locality, always a grist mill (bread is the stall of life!), was east of the post road. And in every place along the Hudson that I visited, the water power of the many streams that flowed into it was back from the river, so that the early settlements were in pairs—the mill settlement on high ground and the landing at the water's edge. Modern Poughkeepsie comprises both.

"Pokipsie"—the name was spelt forty different ways in old records—spread itself east from the post road along Cannon and Church streets ("Church" was the second street laid out) to "Ragged Lane," afterwards Academy street. And in this quadrangular section the largest and so the most interesting fragment of old Poughkeepsie is to be found.

Old fashioned stone flagging with wide brick borders is the rule here and a brick sidewalk is easy on the feet as well as being restful to the eye. On either corner of Cannon street, where it begins at the post



OLD "BARNARD" HOUSE, CANNON STREET,
POUGHKEEPSIE, N. Y.

road (where the cannon were once planted), are two brick buildings in great contrast to each other, the one on the left claiming the attention first.

The edifice, used as a bank ever since 1811, was before that time a residence, date of erection not known. It has marble entrances and string course on which laurel wreaths are carved in low relief. Surmounting its roof is one of those well designed Colonial cupolas almost hidden in this case by a balustrade of wood; and below the balustrade is a wide frieze pierced by many windows covered by grilles which appear to be of iron, but with the rest of the frieze and balustrade they are painted white and so are most effective as ornamentation.

The office building on the right, a once famous hostelry (the Duchess Hotel), is severely plain with its Cannon street entrance unchanged—but what distinction it has when compared with the modern business block with the tin cornice which has intruded on Cannon street just the other side of it!

There are other modern intrusions; but the old work of this old section of the street has so much variety that its unity of effect is surprising, and of course its variety enhances its interest.

There are the Masonic Temple, for-

merly a church, built in 1845; and the W. C. T. U. Building, one time Miss Arabella Bosworth's "Female Academy," of ten years earlier, showing different phases of classic revival; a gambrel roofed dwelling, owned, though perhaps never lived in, by Governor Clinton; the old "Barnard house" that seems, perhaps, more typical of New England; and the two buildings flanking the entrance of picturesque Wood Lane, one older and smaller than the other, but both having that family resemblance which leads one to call them Dutch. The older of the two needs to be viewed from the rear and then its ancient looking dormers can be seen. It is claimed that dormers were not a feature of the earliest work, yet the Kip house of old Manhattan, built in the 17th century had them, and those sliding-down-the-roofs windows were its most conspicuous feature.* The other building also needs to be looked at from a point toward the rear, on Liberty street; it has very decorative and very "Dutch" gable ends.

And there are two relatively large buildings of recent erection on the street, which were expected, perhaps, after their stereotyped details were added, to harmonize with their surroundings. It might seem strange that local examples (in this case right at hand) are so seldom studied when people wish to build in the Colonial style; but unfortunately, in these days when the builder orders from stock, the studying of catalogues is all that seems to be necessary.

Perhaps one reason Cannon street retains its old-time atmosphere is the gardens behind the houses. They have a great amount of brick paving in them—

*See Harper's Encyclopaedia of United States History, new edition, Vol. VI; reproduction of old print under "New York City."



OLD HOUSE, CORNER ACADEMY AND CHURCH
STREETS, POUGHKEEPSIE, N. Y.

walks and dooryards; but some of it has been allowed to vanish in the grass. There are two-story rear porches too, which show that the early residents of the street liked living out-of-doors.

Around the corner, on Academy and Church streets, is more of the quaintness of by-gone days, but of an informal sort, with clothes lines slung about. However, there is one very fine doorway on Church street (No. 196), and this part could be made just as effective by judicious restoration as the more dignified Cannon street might be made.

The importance of keeping a group of old buildings wherever possible has not been often recognized. But instead of making a cardboard model of a Colonial settlement for school children to examine, why not preserve the real thing whenever it can be done?

The Thompson Memorial Library on the Vassar campus would satisfy everyone's conception of architecture, but there is an old structure in the center of Poughkeepsie which only a miracle, so it seems, could have spared; this is the old village hall. It still serves its purpose as municipal building for the city, and this has been made possible by an inconspicuous addition on the rear. So situated on Main street that it faces the post road, it still bears aloft the same bell that once summoned the villagers to town meetings. Its old open bell tower is its striking feature.

The Clinton House, undoubtedly much older than this interesting town hall, is also on Main street, the old "Filkentown road," but in what appears to have been an isolated situation, some distance east of the original settlement. It is built of stone with massive walls. Since it was occupied by Governor Clinton, when the legislature



OLD "GLEBE" HOUSE, POUGHKEEPSIE, N. Y.
BUILT ABOUT 1767.



NO. 196 CHURCH STREET, POUGHKEEPSIE, N. Y.

The owner has taken liberties with the carved entablature of the doorway.

met at Poughkeepsie, and is known to have been used for important purposes, it has been purchased by the state and is now in the care of the Daughters of the American Revolution.

A few blocks farther on is the little "glebe house" or Church of England rectory, built in 1767, which has escaped the usual coat of red paint with which brick houses are disfigured, and other unfortunate alterations.

Dutchess County, which included Putnam then, was originally settled only by the Dutch and some French. It was not until about 1740 that a steady emigration of settlers from Long Island began, and most of them were English.

Near the upper end of the county, between Rhinebeck and its landing, now called Rhinecliff, is the old Beekman place, noted for the political and social gatherings which were held there in pre-Revolutionary days. The original part of it, built in 1700, looks more like a European farm house, with its hipped gable and varying wall heights, than anything American.

"Historic old Rhinebeck" disappointed me, for there was not very much of it left, and the remaining fragments did not show to advantage. To go along a street and see beautiful old work rotting away from



BANK BUILDING, CORNER OF MARKET AND CANNON STREETS, POUGHKEEPSIE, N. Y., AS IT STANDS NOW.

The first floor has been lowered nearly to ground level, and this necessitated the taking away of the short flight of stone steps from the front and side entrances.

neglect, while houses of the Victorian and packing-box types are all glistening in fresh coats of yellow and white, is, to say the least, trying to one's optimism.

There is something more than indifference; there is still contempt for the old, lurking beneath this neglect of our Colonial heritage.

Fishkill Landing, in the lower part of the county, was an important place during the War of Independence, now it is the city of Beacon and proud of its modernity. But, if there had been modern business blocks in the background of the artistic public fountain there, instead of a glimpse of the old picture-building of Fishkill Landing, the good effect of this little monument would be lacking.

Fishkill Village, a few miles back from the river, was a depot of military supplies for the Continental army, and its ancient churches, the Dutch and old Trinity, were both used as meeting places for the provincial congress of the state. On opposite sides of the quiet street with their graveyards adjoining them, they claim the traveler's first attention, but there are other important architectural relics near-by worth looking up.

The old Wharton and Brinckerhoff houses have been changed but little since Revolutionary days. And then there is

another old homestead which history connects with the first mill of Dutchess County.

Both house and mill were built in 1709 on land bought from the red men, and Madam Brett's mill was known far and wide. Her home, afterwards known as the Teller house and still lived in by her descendants, is a good example of the country house built by the early Dutch settlers.

A succeeding type is that of the Verplanck house beside the Hudson, two miles north of Beacon, where the Society of the Cincinnati was organized, and Baron Steuben had his headquarters. This has the gambrel roof which the Dutch builders made a thing of beauty. It was built in 1740.

Another type, spoken of in an old Connecticut County history as a "lean-to mansion," is the Peter Mesier homestead of about the same period, in the picturesque village of Wappingers Falls.

The name Wappingers comes from the tribe of Indians who were the inhabitants of the region when the whites first came to it. This was about 1714, and the original part of the Mesier house, complete in itself, but connected with the main portion, may date back as far as that.

The Mesier family were Huguenots who came from France to New Amsterdam in the seventeenth century to escape religious persecution. They became wealthy merchants and ardent Tories, and when a century later, the American army recaptured the city of New York, most of their property there was confiscated.

But they had just beforehand purchased through an intermediary a large tract of land "in the Wappins," containing the old dwelling house which now bears their name.



CLINTON HOUSE, POUGHKEEPSIE, N. Y.



"TELLER" HOUSE, FISHKILL, N. Y.

The "Teller" house illustrates the old dormer windows referred to in text.

Nicholas Brewer, the former owner, obtained possession of the property in 1741, so the house was probably built soon after that date.

Its interior, although papered and furnished in the worst possible taste, is of

great interest. There are four entirely different types of old fireplaces there, and two of them have scripture tiles in Delft blue and mulberry.

The chimney breast in the "Magistrate's room," where local justice was administered and delinquent negro slaves were sentenced to be flogged, is almost eight feet across, and surrounded by paneling painted buff color with cupboards behind it, which covers the entire side of the room. The old house, perhaps because of long-surviving political prejudices, seems to have been somewhat neglected by antiquarians—or it may be that its Victorian Gothic decorations have caused them to pass it by.

It now contains the village hall and polling place, the headquarters of the visiting nurse, and, until recently, the firemen's headquarters too. Its long porch with the octagon columns, probably an early 19th century addition, and the little park with fine trees which surrounds it, belong to the public. Such is its present-day career of usefulness.

HELEN M. HASTINGS.

June 1919 -

The Architectural Record



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ENTRANCE—RESIDENCE OF HENRY I. HARRIMAN,
ESQ., NEWTON, MASS. JOHN BARNARD, ARCHITECT.
ARTHUR SHURTLEFF, LANDSCAPE ARCHITECT.

THE ARCHITECTURAL RECORD

VOLUME XLV



NUMBER VI

JUNE, 1919

The RESIDENCE of HENRY I. HARRIMAN, ESQ.
NEWTON, MASS.

JOHN BARNARD—ARCHITECT
ARTHUR SHURTLEFF, LANDSCAPE ARCHITECT



By Phil M. Riley

THE French château has a charm that Americans recognize. Its high, steeply pitched hip roof, the numerous chimneys and dormers, the large window openings with casement sashes to facilitate free circulation of air, the absence of wide extending cornices where no heavy shadows exist, and also of brilliant color, are not only eloquent in hospitable appearance but eminently well suited to ensure both summer and winter comfort throughout the structure. The French custom of contrasting much plain surface with a little rich detail and the method of concentrating such detail at the doorway and cornice line, with less at the windows, are commendable points that appeal strongly to the American sense of frankness and love of simplicity.

These pleasing and desirable features of the French château were made the determining factors in designing the residence of Henry I. Harriman, Esq., at Newton, Massachusetts. In developing the design, the architect, John Barnard, of Boston, worked constantly on the theory that art is not an invention but a growth; its object being to secure from the best precedents that which charms the eye and serves a useful purpose and adapt it to meet the particular requirements of the preconceived scheme.

The house stands in extensive grounds upon an excellent natural location protected at one corner by a growth of trees affording a partial screen for the garage beyond and somewhat to one side in architectural accord with the house. There are broad lawns in front and

ample opportunities for the development of gardens and grounds at the rear and sides. The landscape features have been worked out by Arthur Shurtleff, of Boston, and include the seeded terrace twenty-five feet wide with classic balustrade in front of the house, and a mall with false perspective to create a more pronounced effect of distance at the rear.

Of symmetrical arrangement with single-story loggias projecting at each end, the excellent mass and proportion of the house command attention before the detail is noticed. In general mass and contour of roof-line the structure is reminiscent of several well-known châteaux, the pitch of the roof, the dormer windows, numerous chimneys, color effect and lower level of the garden front all being typical of the best French precedents. The detail of the mouldings and other ornament, however, was developed from Italian sources in accordance with a preference by no means inconsistent. Both the Medieval and Renaissance styles originated in Italy and were brought to France by Italian

builders before they reached England. These Italian workmen excelled the French in the design and execution of ornamental detail, and as the best French detail shows this Italian influence unmistakably it was very logically thought preferable in this instance to go direct to the source in the search for prototypes for American adaptation.

Essential features of utility are depended upon chiefly to carry most of the embellishment and to enrich the *ensemble*. No ornament has been employed without a *raison d'être*. The detail throughout is notable for its restraint and nice execution. One notices with admiration the doorway with its columns, surmounting entablature and balcony; the round-headed glazed door so thoroughly in accord with the French windows of the loggias; the pleasing scale afforded by the many lights of the ranging double casement windows; the handsome wrought-iron balconies patterned after the best French work and finished in bronze-green color; the sunken cast-stone panels beneath them with



REAR VIEW—RESIDENCE OF HENRY I. HARRIMAN, ESQ., NEWTON, MASS.
John Barnard, Architect. Arthur Shurtleff, Landscape Architect.



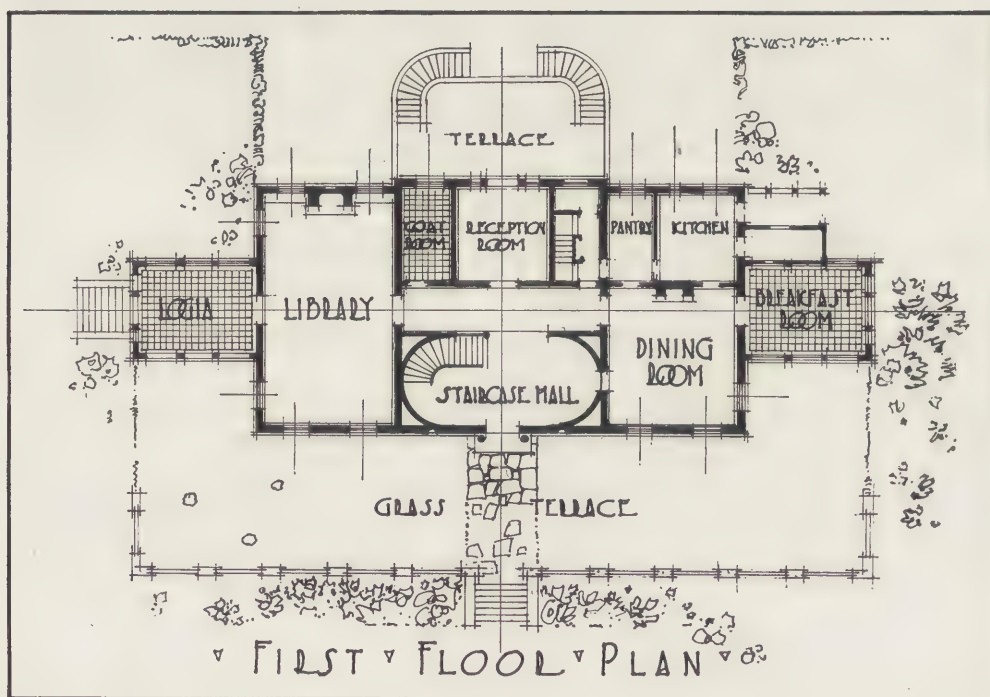
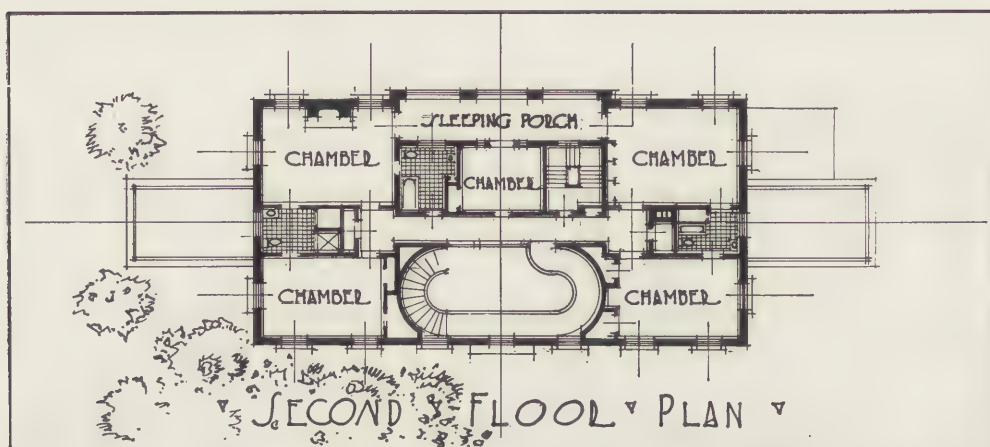
FRONT VIEW—RESIDENCE OF HENRY I. HARRIMAN, ESQ., NEWTON, MASS.
John Barnard, Architect. Arthur Shurtleff, Landscape Architect.

swags of leaves, flowers and birds of Italian character; the round cast-stone shell-like heads of the niches each side of the entrance and their shelves supported by dolphins; the classic balustrade of the terrace echoed on the roofs of the loggias; and the heavy wood cornice with beautifully hand-tooled scroll modillions. Nowhere is the detail obtrusive, yet it becomes visible and lends interest and character when looked for.

As to the general construction, the entire basement is below the grade of the front terrace, with grated areaways to admit light. The foundation below grade is of stone; and where visible in the rear, including the retaining wall of the terrace and the curved buttresses of the stairways, is of concrete, rusticated and lined off to simulate cut stone. Exterior walls above the first floor are of 10-inch hollow tile covered with stucco composed of white marble dust and cement. The inside of these walls is furred, wire lathed and plastered, while the roof covering consists of heavy green slate.

Reference to the floor plans shows a convenient and attractive arrangement of rooms with excellent axial treatment throughout the house. Delightful vistas greet the eye in four directions. From the staircase hall one looks westward through the reception room out over the rear terrace and mall to the tennis courts and an open hill beyond. In the opposite direction the doorway commands the front terrace, entrance drive and broad expanse of greensward. To the southward the terminated view is through the library and loggia, across a space later to be developed as an Italian garden and on to an evergreen hill. Through the breakfast room in the northern loggia the eye again wanders forth upon other expanses of green and away to distant trees.

First impressions are all-important, and the great staircase-hall at once evokes the admiration of every visitor for its beauty of detail and unusual arrangement, running as it does lengthwise of the house and having semicircular ends. Of generous dimensions and



FLOOR PLANS—RESIDENCE OF HENRY I. HARRIMAN,
ESQ., NEWTON, MASS. JOHN BARNARD, ARCHITECT.
ARTHUR SHURTLEFF, LANDSCAPE ARCHITECT.



MAIN STAIRWAY—RESIDENCE OF HENRY I. HARRIMAN, ESQ., NEWTON, MASS.
John Barnard, Architect. Arthur Shurtleff, Landscape Architect.

two stories high, it is very dignified and gives the desirable effect of spaciousness. A Corinthian colonnade separates it from the hall proper and supports the second-floor hall. At the left, an easy curving stairway, with heavy classic balustrade and mahogany hand-rail, rises to a balcony extending along the front of the house, curving about the opposite end and leading to the second-floor hall, which is in effect a continuation of the balcony. Lines everywhere graceful in the extreme render the view from the balcony down through the open well one of rare charm. The staircase hall is paneled in wood up to the broad entablature at the second-floor level with its handsome enriched mouldings and painted in shades of cream. Pilasters occur under the beams supporting the balcony which are also ornamented with enriched mouldings and a scroll at the end. Above are plastered walls with a Dutch metal finish applied in squares and surmounted by a heavy ornamental plaster cornice and frieze at the ceiling.

On axis with the entrance and rear

terrace doors, a round-headed arch gives access from the hall to the reception room, centrally located at the rear of the house with a generous coat room at the left and a service hall and stairway at the right, both being reached through doors in the main hall. The reception room has a delicate plaster cornice and canvas wainscot paneled off with wood mouldings and painted in two tones of French gray. Arches in the plaster of the north and south walls correspond with the entrance arch and French window opening on to the terrace and give symmetry to the room.

The spacious library, extending entirely across the southern end of the house, is in reality a living room as well. In its heavy wood trim with walls entirely paneled up, its beamed ceiling, great marble chimneypiece, floors laid in diagonal squares, and its rich, warm color scheme throughout, this room retains much of the Medieval spirit of the old French châteaux while obviously modern in every refinement and convenience of the present day. Here two



LIBRARY—RESIDENCE OF HENRY I. HARRIMAN, ESQ., NEWTON, MASS.
John Barnard, Architect. Arthur Shurtleff, Landscape Architect.

comfortable lounges before the fireplace provide the very center of home life close to the hearthstone. All standing finish is of walnut, waxed, varnished to set and rubbed to a dull finish, English walnut being used for the panels and American walnut for the mouldings. The detail of the ornamental cornice and beams has been picked out in gold and color. A dark, rich brown is the prevailing color of the wood, and the hangings at the windows of dark, cool variegated pattern offset the warmth of the room and preserve a color balance. The chimneypiece is of cream color and a copy of one in the Ducal Palace at Venice, all appearance of newness being avoided by shades of tan wiped in around the detail. The plaster of the ceiling matches the tone of the chimneypiece.

Done in the Louis XII manner, the dining room suggests the French *château* rather more than the other rooms and is less severe and dignified. It has canvas covered walls of warm champagne color with wood mouldings form-

ing panels which are of a lighter shade. The elaborate Corinthian entablature with its fine-scale detail exquisitely drawn is lighter still and the ceiling with its dainty plaster border almost white. The large Chinese rug of buff and blue determined the color scheme, the hangings at the French windows also picking up a shade in the rug. Thus the deepest and most intense colors are at the windows or at the bottom of the room where the light is strongest.

The northern loggia opening off the dining room, with its round-headed arches on three sides closed by French windows, has been utilized as a light and cheerful breakfast room. One arch leads to the pantry adjoining and so has mirrors divided like the glass of the other windows. Delightful little built-in china closets occupy the spaces each side of the entrance from the dining-room. In fact, symmetry throughout is the key to a good restful design. Above a blue tiled floor the plastered walls are painted old rose, while a charming papered

frieze of trellis design in black and old rose with birds, leaves, etc., lends brightness and individuality.

All of the basement space not required for the heating plant, laundry and various storage purposes, and so often wasted in large houses, has been finished off for billiard and play rooms, which are reached by steps leading down from the hall under the main staircase. They adjoin and are virtually one except for the difference of two steps in floor level. By utilizing the heavy mill construction of the first floor with its 8 by 12 hard pine beams and 3-inch planks, both planed, a pleasing low beamed ceiling somewhat Medieval in spirit is provided. The wood is finished in dark brown with dull gold on the under side of the beams to avoid too somber effect. Rough plaster walls furnish a good background for tapestries, and the fireplace of Weymouth seam-face stone accords well with the other features. The floor of the billiard room is of red tile, while the play room has a wood floor for dancing. French windows open out at grade.

The sleeping-porch deserves particular attention as one of the most important successes of the house. This modern requirement of healthful living often taxes the resourcefulness of the architect to the utmost in order to harmonize outward appearance and interior arrangement with the requirements of the client and the limitations of style and construction. A considerable degree of privacy is desirable and the design and construction should be such as to attract little attention. In the present instance a recessed balcony under the main roof with screens fixed in the spaces between the pilasters of the rear elevation solves the problem in a simple and effective manner which lends interest to the fenestration of this façade. Translucent glass in the frieze ensures ample light in the adjoining rooms.

Altogether this is a residence of beauty and distinction that will outlive passing fancies in style. It is a home of which the owner will not tire, and an artistic achievement in which the architect will not cease to take a just pride.



DINING ROOM—RESIDENCE OF HENRY I. HARRIMAN, ESQ., NEWTON, MASS.
John Barnard, Architect. Arthur Shurtleff, Landscape Architect.

The **ENGINEERS' CLUB of DAYTON**

**SCHENCK & WILLIAMS
ARCHITECTS**

By Howard Dwight Smith

THE story of the Engineers' Club of Dayton is a story of men, of ideas and of accomplishments before it is a story of architecture. Architecture is at its best when it forms a proper and adequate background for human activities and when it reflects these activities effectively. In this club are combined so many features of a certain interesting form of human activities that we are attracted by the story of its organization as well as by the architecture which houses it.

The City of Dayton has come to have the reputation of being a city of pioneers in civic, social and religious work as well as in industry. To catalogue the pioneers in its industrial operations would be to list a large proportion of the men who are behind the enterprises of this "City of a Thousand Factories." Foremost in such a list would appear the familiar names of such men as John H. Patterson, to whom the world owes the development of the cash register, and E. A. Deeds, for a long time Mr. Patterson's business associate, but later and more recently interested in airplane development. Such a list would also contain the names of scientific inventors like the Wright brothers, who have made Dayton the cradle of American aviation, and of Charles F. Kettering, the moving spirit of Delco. These names are mentioned by way of introduction simply to show that there has existed in Dayton a sort of atmosphere of creative endeavor and of scientific research to which a very large proportion of the community's reputation may be attributed. In the commission form of city government, with a civil engineer as its city manager, Dayton was a pioneer.

That form of city government is no longer an experiment, but is recognized as a distinct step forward in political economics. Also the realization of extensive flood prevention plans at Dayton marks the first practical solution of stream control as applied to an entire watershed.

It is natural that such a community should be a fertile field for the inception of an organization of high ideals in engineering association, and that men of ideas and of action should want to meet in other spheres than those of business alone, and to enjoy each others company, to exchange thoughts and to discuss ideas of current or common interest. The embodiment of this spirit in a tangible form is the Engineers' Club at Dayton. When the new home of the club was opened, in February, 1918, the program of the day's exercises contained this foreword:

"The Engineers' Club of Dayton is dedicated to:

"The dissemination of truth,

"The promotion of useful education and civic righteousness,

"The fostering of good fellowship among Miami Valley engineers,

"The professional advancement of its members,

"The inspiration and encouragement of the younger men,

"The making of a technical city where creative endeavor finds reward."

The organization of the club goes back to the beginning of 1914, but its rapid growth led to two things. First, it was "recognized that a meeting place, permitting the fearless and thorough discussion of engineering problems, coupled with the fostering of good fellowship

and the inspiration and encouragement of the younger men, is quite worth while, and will confer lasting benefits upon the entire Miami Valley." And second it was natural that men in the engineering profession from other communities, from far and wide, should be attracted to such an organization to exchange opinions and to share experiences. The Engineers' Club felt that it would be quite fitting to provide a place which could be considered the professional headquarters for all such transient talent.

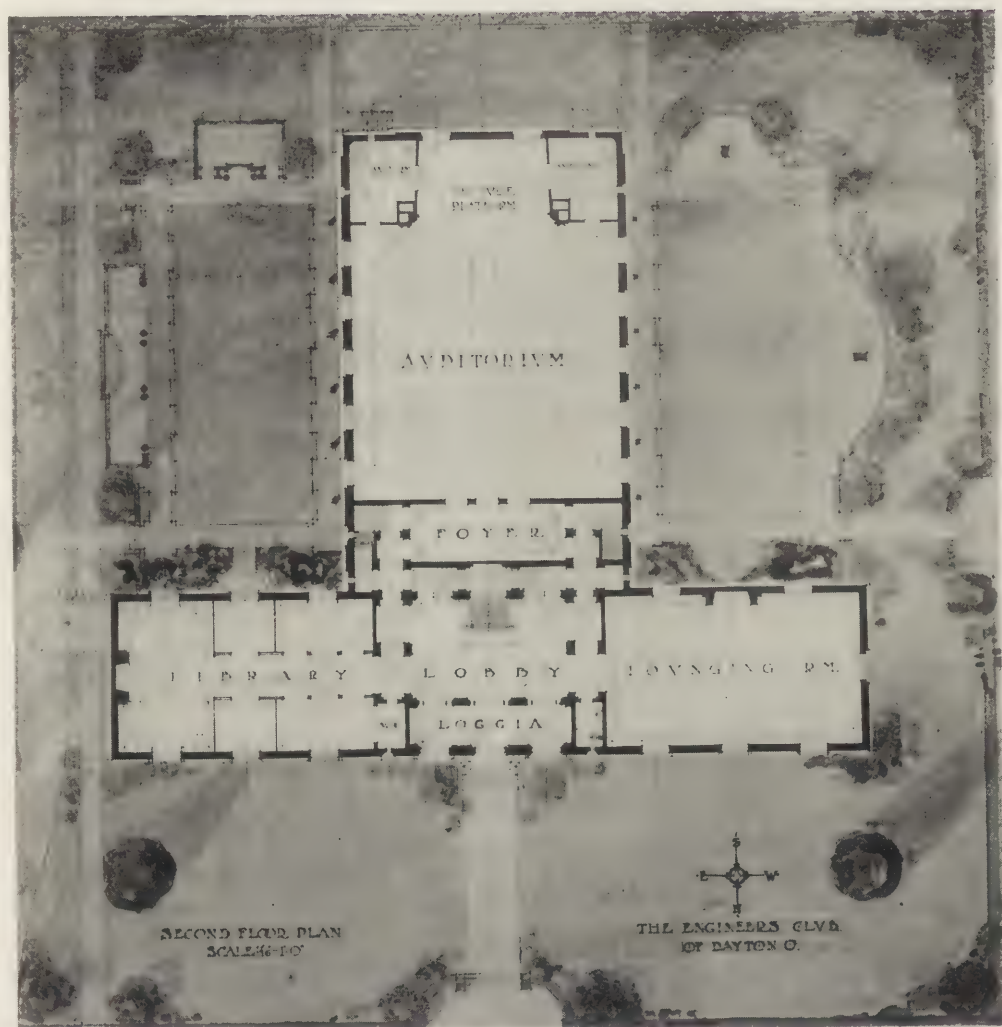
With a generous desire to accommodate these two ideas, and as real pioneers in the movement, two prominent, public-spirited engineers, closely identified with the organization, as well as with the industrial activities which have been previously mentioned, made it possible to erect the new club house which became the home of the organization early in 1918. It is this feature, perhaps, which makes the Engineers' Club unique, for it is hardly to be supposed that such an organization should, in the short

space of three years, be in a position to finance a large building project from a treasury recruited from ordinary sources.

All of this is of interest to architects and to the profession of architecture for the reason that in the broadmindedness of its constitution this club recognizes the close relationship which exists between architects and engineers. This recognition extends to the point of embracing architecture and architects within the influence of the six ideals to which the club has been dedicated, as mentioned above. Architects, their assistants and their draftsmen are assumed to be included in the category of men whose activities are correlated. The local organization of the American Institute of Architects is not absorbed nor even merged in the club, and membership in the architects' organization is in no way related to membership in the larger club. But by arrangement, the courtesies of the club house are extended to the local organization of architects for meetings, conventions and the like, as



PERSPECTIVE VIEW—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.



SECOND FLOOR PLAN-ENGINEERS' CLUB OF
DAYTON. SCHENCK & WILLIAMS, ARCHITECTS.



END OF THE WEST WING AND THE AUDITORIUM UNIT—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.

well as to the local organizations of various national technical associations and societies.

This idea of a parent organization fostering a small organization of architects is not unique in Dayton, and it is quite possible that it was first put into successful operation elsewhere. There is probably no other instance, however, of an organization of architects being fortunate enough to enjoy the hospitality of a club which is supported financially as well as fostered in scientific activities by a group of eminent engineers. This is of considerable interest in these times of restive discussions and expression of opinions in the current press on the subject of co-operation between architects and engineers. So much of this discussion has been unjustifiably disparaging to the architect that it is inspiring to see that there are evidences of healthy association and of cooperation in such high places.

Taking advantage, therefore, of these happy circumstances, the club placed on its new building committee one of its architect members, Mr. Harry J. Williams, an associate of the American Institute of Architects. The firm in which he is associated with Mr. Harry I. Schenck, also a member of the Institute, was entrusted with the commission of building the new club house, and how well they have succeeded in their efforts these few paragraphs and the accompanying illustrations are intended to show. The feeling of responsibility entertained by these architects must have been very great, for in a measure they were their own clients and at the same time it became their duty to study how best to serve their friends and associates in the judicious expenditure of the funds placed at their disposal. There was the incentive to produce the best of which they were capable; coupled with a ready sympathy for conditions and for the



MAIN ENTRANCE LOGGIA—ENGINEERS' CLUB OF DAYTON. SCHENCK & WILLIAMS, ARCHITECTS.



FIRST FLOOR LOBBY—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.

proper and efficient solution of the problems which were presented.

One hardly knows whether to discuss the exterior of the building or its plan first. Perhaps the plan might well be examined first, for it is here that the analysis and solution of the problems are logically met first. From what has been said above as to the motives and sentiments which led to the reorganization of the club—and, in fact, from the fundamental principles underlying most organizations of this sort—it may easily be understood that the architectural problem presents two phases. One which facilitates scientific discussion, stimulating the mentality of its members and their associates, and one which has to do with the ministrations to the physical man, of social and friendly intercourse, of relaxation and enjoyment.

The largest element in the plan, the

auditorium with its accessories, meets the first phase of the problem, and the four other principal plan units, the lounge, the billiard and game room, the dining room and the library have been designated to meet the second phase of the problem. These five elements, with the adjuncts in the way of lobbies, stairs, corridors, coat rooms and offices solve the problem, and from strictly an engineering point of view might have been sufficient to fulfill all needs. Bearing in mind that some one has said that "an engineer is one who can conceive, design and execute a material thing in an economical and efficient manner," it may have been the logical thing to have stopped when these five elements had been most conveniently joined together and properly served by adjunct circulation, stairs, etc. But happily to these essentials have been added some niceties which make the building an aristocrat



FIRST FLOOR "LONG GALLERY"—ENGINEERS' CLUB
OF DAYTON. SCHENCK & WILLIAMS, ARCHITECTS.



LADIES' ROOM—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.

whose helpful influence on the busy workaday engineers of a bustling middle western city is not fully realized at first glance. A ladies' room, a "long gallery," a loggia, private dining rooms, and emergency accommodations for out of town visitors (there are no general dormitory facilities) are some of those niceties which add to the practicability as well as to the distinction of the club's home.

The logical arrangement of the plan leaves little to be desired. There has not been any necessity for crowding on the lot and the architects have chosen to use an inverted T-shaped plan which has given an abundance of light in every portion of the building. It is particularly to be noted that in spite of the fact that there are seven separate and distinct outside entrances, not including the French casements in the private dining rooms, there is no waste space in the circulation in the building. The two

largest parts of the building, the auditorium and the dining rooms, with the kitchen service, occupy the vertical bar of the inverted T plan. The rest of the rooms and the main stairs and lobbies are in the cross bar of the T. The grade entrances into the foyer at the dining room have very conveniently divided the circulation into the building at the busy noon hour, for instance. An objection to this arrangement might be raised by one used to metropolitan ways and customs, because a door attendant is not enabled to keep an accurate line on the constantly changing list of his patrons during a busy hour of the day. But it may be said in defense that such a custom is hardly necessary here, for by some peculiar method, perhaps by an attribute of "breezy westernness," the presence of any given member is easily known.

The site upon which the building is

erected has a north frontage on Monument Avenue, a boulevard-like thoroughfare which at this point overlooks a narrow strip of public park along the bank of the Miami River. It is to this side that there is the most openness, and on this side are the views and vistas. Advantage is taken of this in placing a long façade to the north. All the important rooms except the two largest, the auditorium and the dining room, share these views and this openness. The open loggia over the main entrance is specially well placed.

The entire exterior mass is a logical and straightforward expression of the plan. Seventeenth and eighteenth century English architecture is plainly reflected by most parts of the outside, and the building may be placed, at least from superficial appearances, in the general style known as Georgian. The blocklike

mass of the projecting wings and the flat decorated band which does duty as a cornice are undoubtedly inspired, perhaps remotely so, by the end pavilion of the Radcliffe Observatory at Oxford. The small order used at the front entrance and along the lateral façades of the dining room is even more closely allied to the columns and entablature found in that charming old country seat at "Bowood" in Wiltshire.

These two Georgian precedents have had their influence on the design of the Engineers' Club perchance through their contemporary interpretation in the large country residence completed some three years since at Woodbury, Long Island, illustrated in the architectural press about that time. A certain eighteenth century urban effect is given to the Engineers' Club, however, by the use of gray-buff brick, a little rough and in tone not un-



FIRST FLOOR FOYER BETWEEN THE LOBBY AND THE MAIN DINING ROOM—ENGINEERS' CLUB OF DAYTON.

Schenck & Williams, Architects.

like the row of Georgian fronts in Portland Square, London. The trim is buff Bedford limestone, a product so easily obtained in these parts as to be considered almost a local building material.

External expression of the dining room has been manifested by the grouping of the large French windows within a pilaster order treatment and facing each of its open sides upon a garden. The level of the grass and walks in these garden areas has been lowered effectively to relieve what would otherwise have appeared to be weighted down or depressed into the ground by the auditorium walls above, remembering that the mean level of the auditorium floor is quite a bit lower than that of the rest of the second floor.

The character and refinement of the exterior ironwork, the numerous balconies and the porte-cochère of the east entrance are quite "Adam," and the low

standing lamps are reminiscent, in height at least, if not in size and shape, of the English coach lanterns which were hung on low posts or iron brackets beside the gateways, on the doorways or along the roadways of the old estates.

Once one passes through the front door the idea of the Georgian style and of the eighteenth century is supplanted by the forms and fancies of an older and earlier day. Beyond the simple vestibule one is confronted in the lobby with the first run of stairs, of Tudor or Elizabethan design not unlike the old example in Blickling Hall, Norfolkshire. This strikes the note of most of the interior. With the exception of the ladies' room, of which more will be said presently, and of the auditorium, which quite rightly is treated plainly, the rooms are finished and decorated after the fashions and with the forms and ideas of that



MAIN DINING ROOM—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.



SECOND FLOOR LOBBY—ENGINEERS' CLUB OF
DAYTON. SCHENCK & WILLIAMS, ARCHITECTS.



READING ROOM ON THE SECOND FLOOR—THE PHOTOGRAPH OVER THE MANTEL IS THAT OF WILBUR WRIGHT—ENGINEERS' CLUB OF DAYTON.
Schenck & Williams, Architects.

general period between Gothic and Classic in England known as Tudor. That period was a vigorous one of transition and produced many fine examples of domestic architecture which have inspired a great many of our efforts in America.

There need be no dispute with the architects for dressing up the interior in Tudor style while the exterior of the building speaks of a later time. More are they to be commended if, by the use of soft dark stained wainscots and panelings, rough plaster walls, geometric pattern and beam ceilings, they are able to create a feeling of inviting "homeliness" and attractiveness. And it may be said, too, that engineers are quite as susceptible as the rest of the public to the call of the current fad for "Old English" ideas and forms and atmosphere. Where the designers have adhered most closely to their precedent

have they been most successful. The plaster ceilings in geometric patterns excel their attempts at heavy plaster beaming.

Conveniently disposed about the lobby are the simple club accessories, a coat room, a men's room, an office and telephone booths. To the west, or right from the entrance, is the billiard and game room, accommodating four tables and serving conveniently as an auxiliary lounge and smoking room. It is a low room and no attempt has been made to give it an appearance of height. From the opposite end and from the corner of the lobby opens the "long gallery," a convenient name, around which there are associated certain historic sentiments. What Tudor manor house did not have its long gallery with long views and vistas, and tapestries and unending successions of patterned ceilings? While this long gallery in the Engineers' Club

serves as a means of circulation connecting the carriage entrance with the lobby, still, as in the old houses, it is of generous width, and when provided with chairs and seats it serves also as a waiting space, for conversation or informal conference. It is usually referred to at the club itself as the "visitors' gallery."

Off from this long gallery opens the ladies' room, appropriately secluded from the general activities of the club. Strange as it may seem, this room, dressed up in an entirely different style from all the rest of the interior, is the gem of the building. Departing from Tudor and Elizabethan, the architects have expressed themselves in the refined and genteel style of the Adam Brothers, a style of low relief and classic forms, with an applied or painted finish. This room has been executed with commendable consistency and the rectangular leadings of the large French casements are quite in keeping here. Not dissimilar in general character is the dining room foyer; more severe, however, than the ladies' room and treated with hard plaster wall surfaces with few lines and little decoration, much after the fashion of the severe entrance halls of the eighteenth century London houses of which we have spoken before. This dining room foyer is on a level with the dining room itself, five steps below the general level of the first floor, which permits of added ceiling height in the dining room and in the auditorium above.

The main portion of the dining room is approximately twenty-eight feet wide by forty-five feet long, and is flanked by side aisles of small private dining rooms in such a way that the whole can be thrown together more or less easily for the occasional accommodation of large parties. For everyday use this arrangement in plan is quite satisfactory, for one may take one's choice as the mood inspires to mingle with one's fellows or to sit secluded and unhindered or unchallenged by friends. The usual club convenience of having accommodations for private parties by members should not be overlooked in passing.

In the second floor of the building the

disposition of units is almost identical with that of the first. The main lobby has its counterpart in another of the same dimensions and the dining room foyer of the floor below becomes the auditorium foyer above. The game room is echoed by the lounge, a room of the same area but of greater ceiling height. In the east wing the library group of rooms is superimposed over the ladies' room and the visitors' gallery.

The upper lobby, like the dining room foyer, is executed in stonelike plaster, or "Caen stone," which has judiciously been left unscored by false stone joints. Perhaps no other material has been subjected to more use in imitation of another material than the so-called "Caen stone" or hard plasters. Hard plaster or stonelike walls have their definite place in interior design, particularly appropriate in vestibules, halls, corridors and the like, but their use in good design need not be disguised by the addition of false jointings or otherwise. Happily this has not been done in the Engineers' Club.

The second floor lobby opens on to the loggia, which overlooks the park and the Miami River at a point almost opposite one of the centers of flood prevention activities, the confluence of the Mad River with the Miami.

Axial with the unobstructed portion of the lobby are the library and the lounge. The term library is applied to a group of rooms housing the nucleus of a technical collection. The principal room of this group is the reading room, comfortably furnished and embellished by a large mantelpiece. The four other rooms of the group are like alcoves whose walls are lined with book shelves. These alcoves can suitably be used for intensive study or may be appropriated for private conferences without interfering with the usual and normal functions of other club rooms.

The lounge at the opposite end of the lobby occupies the area of the entire west wing, measuring some thirty by fifty feet. Here is a large room, quite informally furnished, with the dominating idea of making it all that the name implies, a room for lounging, for a mo-



LOUNGE—ENGINEERS' CLUB OF DAYTON.

Schenk & Williams, Architects.

mentary slackening of the energies. In the great space embraced by the wainscoted walls and the oak beamed ceiling and in the presence of the almost overpowering mantel, one seeking rest may lose oneself in a secluded cushioned corner, or muse before the fireplace, or find diversion in music.

As a club house the features described above have been, and are now, affording quite ample and satisfactory service in every respect, and it is to these parts of the building that the members look for their daily accommodation and enjoyment. But the feature of the building which does most toward the "dissemination of truth," the inspiration of its members and the extension of its influence along educational lines is its auditorium. Its platform is the center of an open forum from which discussions have been led, lectures delivered, experiments performed and demonstrations

made, dealing with a great variety of subjects and problems of the engineering and industrial world. Of its general properties as an auditorium all that need be said is that its seating capacity is about four hundred and fifty on a floor area of approximately fifty-five feet square. It is provided with a permanent fireproof projection booth concealed within the rear wall, and the exacting and punctillious fire code of the Ohio State Board of Health is amply complied with by the four minor fireproof stairways, one at each corner of the room.

The acoustics in the auditorium are good, as is usually the case in square low rooms with ceilings which are somewhat broken up by beams, but the special feature of the room, in keeping with the other appointments of the building, is the provision on the stage of all the facilities necessary for any sort of experi-

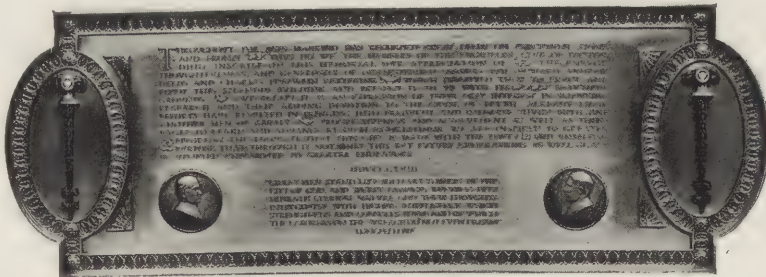
ment or demonstration. There are water and gas connections, steam, and compressed air and electricity for any form of light or power.

The completeness of the special equipment on the stage to a certain extent is a measure of the equipment throughout the building. With so many technical interests represented on the roll of membership, it is only natural to find that all sorts of forms and devices are included in the construction of the building. The steam heating plant and a ventilating system represents the last word among heating engineers, with valves, regulators and devices applied here and there which do almost everything connected with the system except deliver coal to the bunkers, and open and close the windows. Those members whose business slogan is "do it electrically" have seen to it that the electric equipment has not been slighted. Of the lighting fixtures it must be said to their credit that they are not conspicuous, but fit in effectively with the general scheme of things.

The housing of a club of the reputation and influence of the Dayton Engi-

neers in a building which is architecturally appropriate, is a credit to the club and to the architects. The sphere of its influence measures quite well with that of a club as large and as well established, as, for instance, the Engineers' Club of New York, whose commodious quarters are in West Fortieth Street. The Dayton Club is an inspiration to communities smaller than the metropolis, but equal to it in enthusiasm and possibilities.

The appreciation evinced by the rank and file of the club for the "energy, thoughtfulness and generosity" of their esteemed leaders, Colonel Deeds and Mr. Kettering, in making possible the erection and equipment of the building has been recorded on a bronze tablet which has been placed in a frame on the second floor lobby beside the stair well railing. This tablet expresses the sentiment that the building was erected as an expression of interest in scientific research and devotion to the cause of truth, "that through it not only this but future generations shall be uplifted and moved to greater endeavors." Good architecture is a fitting background for such sentiments as these.



MODERN INDUSTRIAL PLANTS



By George C. Nimmons

Part VII.

SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

THE success and importance attained by commercial and industrial concerns is measured, first, by the wealth which they accumulate and distribute and, next, by the usefulness of the products which they supply. But the character of the policies and business methods by which their success is achieved is also of importance and concern to the public. The leaders in industry and commerce set precedents and fix standards which the mass of smaller concerns follow more or less. If the policies and business methods yield satisfactory profits and, at the same time, insure equitable treatment of customers and employes, clean, wholesome and attractive buildings and grounds, then communities, cities, and indeed the country as a whole are benefited.

It has been demonstrated beyond question of doubt that considerate and generous treatment of employes and the building of attractive industrial plants are in no way a hindrance to success on account of the additional investment which they may require; on the contrary, they have often proved to be an essential part of the means by which the success was attained. A model plant is in reality the "master tool" for the workmen; and the proper treatment of employes by the installation and maintenance of welfare work, as discussed in the preceding articles, reduces the turnover of labor and improves the personnel of the workmen.

The outlook for the future of American industry and commerce is promising, largely for the reason that the policy adopted for the conduct of their business by a large number of industrial leaders has in recent years been shaped so as to include a "square deal" for the employe and the best that architecture can provide in the way of buildings and grounds, specially designed and constructed to suit each particular business and to reduce to a minimum the cost of production and the handling of goods.

Among such concerns are Sears, Roebuck & Co., whose main plant is the principal subject of this article. Their business consists of supplying all kinds of merchandise to customers who order by mail from the firm's catalogues, which illustrate and describe the articles for sale. The principal catalogue is a book of over 1,200 pages. The goods sold include every conceivable kind of merchandise of a city department store and other things besides. Many of the goods are manufactured by the company, which operates ten shoe factories, a stove factory with a capacity of 200,000 stoves annually, and factories for pianos, wall paper, cameras, paint, buggies, wagons, agricultural machinery, etc., mostly in other cities than Chicago, and maintains extensive branch plants in Kansas City, Seattle, and Dallas.

The main plant in Chicago consists of a group of buildings on the west side of the city on a tract of land about two



GENERAL VIEW OF SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.

blocks wide and half a mile long, which was selected as the most available site nearest the center of the homes of their employes, with good transportation and plenty of room for expansion and development of the out-door features of the grounds illustrated in the present article.

The erection of this great plant furnished an opportunity of designing and planning a plant specially adapted to this particular business, on vacant ground with plenty of room and no obstacles to interfere with whatever arrangement and design seemed best for the purpose.

The requirements for the plant consisted, first, of a great merchandise building in which the goods for sale should be stored and from which they should be shipped by freight, mail or express.

The second requirement was an administration building, where the orders

for goods and other correspondence would be received and where would be located the administrative departments and offices.

The third essential was a printing plant, where catalogues and printed matter were to be produced for distribution among customers.

In addition to these three essentials, there were many other requirements to be provided for to complete the working out of the plans; and, furthermore, there was one important requisite of the original plans which is of interest, namely, full provision for welfare work for employes. This included, among other features, the outdoor recreation and athletic grounds for employes which were planned in connection with the laying out and arrangement of the main plant.

One of the most important matters considered at first was that of making

ample provision for the growth of the business. The amount of business done in 1905, when the plant was built, was about \$50,000,000 a year. When the plans for the buildings were being determined no one imagined that the business would grow to its present size of about \$200,000,000 gross sales shown by the last year's statement; nevertheless generous allowance was made for future growth, in the way of building foundations strong enough to carry additional stories and spaces for additions to buildings. If these provisions for growth had not been unusually generous and if the mechanical handling of goods had not been developed to its present state of efficiency, the business would have outgrown the plant soon after it was completed.

By reference to the plan it will be seen that the Merchandise Building, where the goods are stored, is the large building with the tower on the right, extending about 1,200 feet in its long

dimension and consisting of two parts: first, the part built around a hollow square, in the center of which is the shipping room, and, second, the "U" shaped part of the building marked "Annexes," where the railroad tracks come in. These are the freight tracks, where forty cars can be placed at one time inside of the building with a large skylight roof over them, closing them in from bad weather. The annexes of this building were originally only three stories high, but since then they have all been carried up to nine stories in height.

The Administration Building is the five-story building in the illustration that fronts the sunken garden. This was originally two stories high above the basement. It contains the administrative departments and offices and also the restaurants and lunch rooms where as many as 12,000 lunches have been served during the noon hour.

The Printing Building is at the left of the main group and it has received



SUNKEN GARDEN IN FRONT OF THE ADMINISTRATION BUILDING OF SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.



PRINTING BUILDING—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.

two additional stories since it was built. Its present annual output is 65,000,000 catalogues, sales books and other printed matter.

The power, heat and light for the plant are all provided for in a separate power house, where the fuel and ashes are handled mechanically and where there are four direct connected generators with a capacity of 4,000 horse power and a 2,000-horse power steam turbine with its generator. There is a complete system of underground tunnels for pipes, wires, etc., that extend from the power house to all the principal buildings. Martin C. Schwab was the mechanical engineer for this work.

In addition to these main buildings are the following separate buildings as shown by the plan: The grocery department, the wall paper, paint and box factories, manufacturing building No. 1, the garages, field houses for men and

women, the Y. M. C. A. building and the apartment building for the chief of police and the fire marshal, an engine house and a green house.

Probably the best way to give an idea of the manner in which the business of the firm is done and, at the same time, show the principal requirements for which the buildings were erected, is to follow the course of a letter received from a customer in which there is an order for goods.

When the letter arrives in the Administration Building, it is opened, together with others, by grinding its edge on a machine. Its contents are divided, the remittance going one way after auditing and the order going to a clerk, who enters a record of it and then makes out a separate ticket for each department handling the goods called for by the order. These tickets, to which are attached the shipping labels or freight or

express receipts, are then sent from the Administration Building through pneumatic tubes over to the proper departments in the Merchandise Building, where the goods called for are selected, checked and wrapped, with the tickets to identify them attached. Each ticket calling for goods always has marked on it the particular time at which the articles called for are to arrive down in the shipping room on the second floor. When the time arrives, or rather just before that, the article or package of goods is placed on a traveling belt conveyor, which takes the articles along to a great steel spiral chute, about eight feet in diameter, that extends on down to the sorting division on the third floor. The goods come down this chute and slide out on another belt conveyor, which carries them along to the sorting division. Here are many clerks, and traveling belt conveyors apparently moving in every direction. When the package

which we have been following arrives before a certain clerk, he takes it off the incoming belt and places it on the belt which is headed in the direction of the particular section of the shipping department where our package is to be packed. When it arrives at this section it is placed in a basket on a rack, where it waits till all the other articles ordered by our customer have arrived. When the last article has arrived in the basket to complete the order, the basket is taken out of the rack and placed on a declining gravity slide on which it slides down from this balcony elevation to the packer. The packer takes the goods out of the basket, puts them on the counter in front of him and immediately decides what kind and size of a box he will pack them in. He calls out a number indicating this, and someone up above hands him down the box of his choice. After the goods are boxed and labeled they are placed on another belt, which takes



VIEW OF ATHLETIC FIELD IN FRONT OF THE MERCHANDISE BUILDING ON THE LAST FIELD DAY—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.

them away for shipment. The package may be shipped by freight, mail or express; if by parcel post the package is weighed, stamped and conveyed to a bin where other packages going to the same locality are accumulated to be sent over the same railroad or route.

The Government has a post office in the plant, where all the postal duties are attended to, thereby doing away with the necessity of sending all of this matter through the Chicago Post Office. As the business done is equivalent approximately to that of a city of about 150,000 inhabitants, the Chicago Post Office is relieved of a great deal of work. The express companies also have their representatives at the plant, which enables them to handle their shipments directly to the railroads.

While only one spiral chute was referred to as a means of conveying the goods down to the shipping room, there are really six of them located at convenient points in the Merchandise Building. Five of these chutes have three planes in them so that three different streams of goods can go down at once.

Articles which are too large and heavy to come down the spiral chutes are stored in the annex buildings, where they are taken down on trucks by the elevators and loaded into the cars ready

to receive them in the freight depot.

It will be noticed from the plan that all of this outgoing movement of goods takes place from the center of these buildings outwards. This is arranged

so as to have as little interference as possible with the incoming supplies to replenish shipments. All of the railroad tracks on which incoming goods arrive are on the outside of the buildings. Wagon and truck spaces are also provided at several places around the outside of the buildings.

In this way an enormous amount of merchandise is handled promptly in and out of the buildings. During some seasons of the year the orders of a single day may exceed 100,000, which at their average of ten articles to an order means the handling of over 1,000,000 articles in a day. An interesting feature of any business which grows to the size of this one is the problem of handling it, controlling it without confusion and on an economical basis

of cost. Aside from proper business management and control, there is also the necessity of the right application of mechanical methods of handling goods in buildings and quarters that are specially made to suit the purpose. One who has inspected a highly organized and scientifically run industrial institution of this kind can readily picture the chaos and



VIEW OF ENTRANCE TO ADMINISTRATION BUILDING ACROSS THE POND OF THE SUNKEN GARDEN—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects
of Additions to Original Plant.

confusion that would result if it were run by hand in a building unsuited for the purpose. The undertaking could not possibly succeed.

The other outstanding features of Sears, Roebuck & Co.'s plant are those related to welfare work for employes. The employes last year averaged about 16,000 at the main plant, and about 20,000 at the factories and branches.

Ever since the firm was established, welfare work for employes has had a prominent place in the policy adopted for the conduct of the business. At the main plant, the important features of this work are the generous provisions for outdoor recreation, amusement and athletics, a Y. M. C. A. building equipped not only with a gymnasium and a swimming pool, but with all the usual social and educational facilities, sanitary and attractive locker and coat rooms, lavatories, toilets and rest rooms throughout the plant, extensive lunch rooms, a complete hospital, and a very effective system of profit sharing.

The outdoor attractions for the employes during the periods between work hours consist of an extensive sunken garden in front of the Administration Building and of grounds for games and athletic sports.

The sunken garden is a formal park with a pool and fountain and with a dense planting of trees and shrubbery along the back to screen off the view of the adjoining unattractive property. In the center of the garden is a pergola with shady seats overlooking the pool, which is full of fish and a good variety of aquatic plants. Long paths traverse the garden east and west, along which a succession of the best sorts of garden flowers are transplanted from the greenhouse on the grounds.

In the two blocks west of the garden are the athletic fields, opposite the Merchandise Building and its annexes. In the first block are the main baseball ground, numerous places for indoor baseball, a large running track and grounds for outdoor field sports. In this block



APARTMENT BUILDING FOR FIRE MARSHAL AND CHIEF OF POLICE—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.

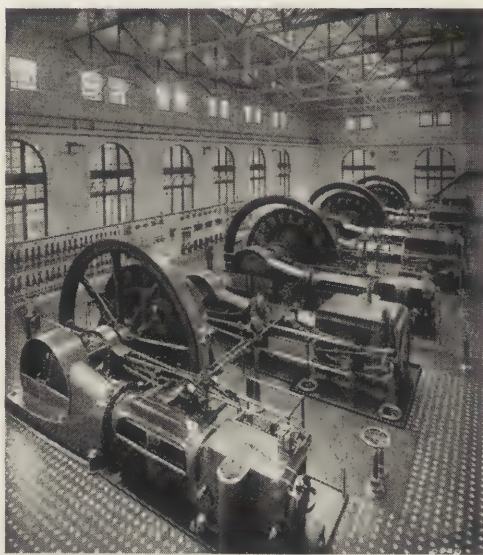
is also the men's field house, containing lockers, dressing rooms, shower baths and toilet facilities. In the next block are the tennis courts, which have been made quite a feature of the sports on account of their popularity. The courts are kept in the best possible condition and have resulted in developing some champions of considerable reputation. The women's field house, with lockers and complete accommodations, is situated in this block. Series of games and occasional championship tournaments are held, together with concerts by the band which has been organized among the employees. The important athletic event is the annual field day, held in mid-summer. Our illustration shows the meet last year, at which the Jackie band and a battalion from the Great Lakes Training Station were present to add

interest to the athletic contests. There were 25,000 people on the bleachers.

The lunching facilities consist of a café for the officers and heads of departments, a visitors' restaurant and cafeterias, restaurants and lunch counters for employees. On account of the great number of employees at lunch they are divided into three shifts and dismissed from their work at different times so as to avoid overcrowding the lunching

places. Employees have their choice of the kind of lunch preferred in each case, and the cafeterias have proved to be the most popular. In connection with the lunching facilities there is a large sanitary kitchen. The price for lunches is based on the absolute cost of the food and service.

The firm has adopted a plan of profit-sharing which has received favorable



ENGINE ROOM—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



MAIL OPENING DEPARTMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.



INDEX ROUTING DEPARTMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.



CORRESPONDENCE DEPARTMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.



SORTING AND ASSEMBLING DEPARTMENT—ARTICLES ARE BEING SORTED AND ASSEMBLED PREPARATORY TO THEIR DELIVERY TO THE SHIPPING ROOM—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



POSTAL DEPARTMENT, SHOWING PACKAGES ARRIVING FOR SHIPMENT BY PARCEL POST—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



FREIGHT PACKING DEPARTMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



A TYPICAL ALCOVE IN THE MERCHANDISE BUILDING, SHOWING HOW THE FORWARD STOCK OF GOODS IS KEPT READY FOR SHIPMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.

comment by experts on the subject. The plan is called "The Employees Saving and Profit-Sharing Pension Fund." Any employe who has been with the company three years can deposit 5 per cent. of his salary not exceeding \$150 per annum, to which fund the firm will add 5 per cent. of the firm's net earnings each year without deducting therefrom dividends to the stockholders. While joining the fund is voluntary on the part of the employe, 92.4 per cent. of all eligible employes have already enrolled. They now have 20,000 shares of common stock of the company to their credit in the fund, in addition to 60,000 shares which they already own, making 80,000 shares, which is more than 10 per cent. of the company's common stock.

Under the terms of the plan a participant may withdraw his accumulated savings and profits any time after ten

years. An exception, however, to this rule is made in behalf of the women who leave their employment for the purpose of getting married. They can withdraw their savings and profits after five years' service. In case of death the relatives or estate of any participant will receive the savings and profits, no matter what the length of service may have been.

An exception is also made in behalf of all employes entering the war service. These men not only get their positions back when released from service, but also re-enter the fund without penalty or loss. Employes withdrawing from the fund under other conditions not above described receive the amount of their own deposits made, with interest at 5 per cent. compounded. The fund of the employes is invested in the stock of the company, and it has already acquired since its establishment in July, 1916,



GATHERING AND BINDING MACHINES OF THE PRINTING DEPARTMENT—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.

20,000 shares of stock. As this fund increases it is likely that in the course of time a majority of the stock will belong to the employees or to those who have been employees and allowed their shares to remain as stock with the fund.

The first year when the fund was established the company paid into it approximately \$412,000; the second year, \$905,000, and this last year approximately \$1,000,000.

As examples of the results of this fund to date the following instances are

given: An employee earning \$15 a week, after saving 5 per cent. of his salary, plus the calculated profits on the stock, at the end of five years would have \$901.22; in ten years, \$2,648.55, and in twenty years, \$11,426.56. At the end of ten years a man getting \$20 a week would have approximately \$3,500, and at the end of twenty years about \$15,000; while the man getting \$25 a week at the end of twenty years would have to his credit approximately \$20,000. For the last three years the amount contributed by the firm for every dollar



CLOTHING DEPARTMENT, SHOWING THE CUTTING OF CLOTH FROM PATTERNS IN THE MANUFACTURE OF CLOTHING—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.

saved by an employe has varied each year from \$3.02 to \$3.26.

In addition to this system of profit-sharing the company maintains another plan of paying all employes who have been with them five years a check for 5 per cent. of their annual salary on the fifth anniversary of their employment. On the sixth anniversary 6 per cent., and so on up to the tenth anniversary of their employment, when they receive 10 per cent. of the salary, and thereafter the same rate as long as they are employed by the company.

The Medical Department is organized under the direction of a doctor in charge, who has eight assistant doctors that spend part of their time at the plant, and thirteen nurses, who divide their time between the work in the doctors' offices and visiting the homes of employes. There is also a clerical force of twelve, including stenographers, record clerks

and file clerks. For the use of this force there is a complete modern hospital in the top of the Merchandise Building, having eighteen rooms, among which are the reception hall, men's and women's examining rooms, private examining rooms, rest rooms, dental offices, laboratories, dispensary, surgical dressing rooms and a room for the clerical force.

The extent and nature of the work carried on may be illustrated by the report of last year:

Examinations	34,138
Medical cases	33,881
Surgical cases	62,817
Dental cases	1,109
Nurses' visits	6,437

Total138,382

The organization and method of conducting the work is divided among the following five departments:



ONE OF THE CAFETERIAS IN SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



VIEW OF LUNCH COUNTER IN SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.
 Nimmons & Fellows, Architects of Original Plant.
 George C. Nimmons & Company, Architects of Additions to Original Plant.

1. Medical Supervision
 - a—Before employment
 - b—After employment
2. Surgical Supervision
 - a—Where employer is responsible
 - b—Where employer is not responsible.
3. Dental Supervision
 - a—Before employment
 - b—After employment
4. Sanitary Supervision
5. Medical Welfare Work

Medical Supervision:

a—Before employment.

Every applicant is given a thorough physical examination before he is put to work. The object of this is threefold:

1. To protect the applicant from doing work which is not compatible with his physical condition; in other words, to endeavor to fit the job to the individual as nearly as possible.

2. To protect employees from the

necessity of working with fellow employees who have communicable diseases.

3. To protect the employer from having in his employ one who may be a source of liability because of some physical defect.

The last two conditions are the only ones which justify rejection, and the percentage of rejections is comparatively small.

b—After employment.

It is their rule to re-examine the employees at least once a year. This is done by what is known as Department Examinations. Every employee is called to the doctor's office and given a thorough examination, and is advised as to his physical condition. Wherever it is indicated, he is recalled at more frequent intervals, until his physical condition is satisfactory.

Needless to say, those employees who are subjected to work which is likely to

cause occupational disease are given an examination once a month.

Medical treatment is given for minor ailments. Wherever necessary, the patient is referred to his own physician for further treatment. In a few cases, where family conditions are such that the patient cannot receive proper care at home, he is sent to the hospital. Immediate attention to minor ailments prevents many serious complications.

Employees have free access to the doctor's office, and whenever necessary may come for advice and examination. They must report here for a pass home on account of illness, and they must also report here for a pass to return to work after absence because of illness. In this way many communicable diseases are found in their incipency and proper treatment is immediately started.

The work of the nurses is of great importance. When an employe is absent three days or more, a nurse is sent to the

home. If the patient is ill, she gives bedside care and helps in any other way she sees fit. If the patient has no medical care and it is evident that he should have, the nurse sees to it that he gets proper attention at once. This close contact with the patient in his home is of exceedingly great value in preventive medicine. Instruction in hygiene is tactfully given, and in this way the entire family benefits.

Surgical Supervision:

a—All cases which are house accidents are entirely taken care of by this office. All minor accidents must report at once to the doctor's office. Much has been done in preventive surgery. Immediate attention means the same here as in medicine.

b—As to the injured cases which are not house injuries, if a few dressings will keep the patient on the job, they are taken care of. Where necessary, the patient is referred to his family physician or to some surgeon of reputation.



GRILL ROOM—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.



FOOD COUNTERS IN ONE OF THE CAFETERIAS OF SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.
George C. Nimmons & Company, Architects of Additions to Original Plant.

Dental Supervision:

a—Before employment.

Whenever the examining physician finds evidence of diseased teeth, the applicant is referred to the dentist, who makes a careful examination and advises the patient.

b—After employment.

It is the purpose to have every employe receive the benefit of a careful dental examination. This is done by department examinations. Any minor work is done by the dentist, such as temporary treatment of a toothache or cleaning the teeth. The greater part of this work is educational.

Sanitary Supervision:

Regular inspection is made of the toilets, wash rooms, drinking fountains, cuspidor service, etc. Ventilation, lighting, disinfection and fumigation also come under supervision. In this con-

nection the close co-operation of the Engineering and Safety First Departments is secured.

Educational Work:

Dependence is largely placed on the personal contact with the employe. A few minutes' talk with the employe after his examination, or advice when he seeks it, seems to sink in deeper than lectures. Here again the work of the nurses in the homes is of great value.

There are also bulletin boards on which are posted Safety First and Health Bulletins.

Medical Welfare Work:

This consists largely in seeing that the patient has proper medical attention, also in adjusting minor complaints on the part of the employe in helping him to fit into the particular job which he has been employed to fill. The medical force is in a position which results some times in re-

ceiving confidential information from employees that no other department could receive that often gives an opportunity for good advice and the straightening out of difficulties which might otherwise make trouble if not attended to.

In concluding this brief description of Sears, Roebuck & Co.'s plant it will be of interest to give some information as to the extra cost incurred through the ornate architectural treatment of the buildings and grounds.

All are agreed that pleasant and attractive workshops and grounds are desirable, but many have an exaggerated idea of their cost. It is usually an agreeable surprise to learn from the experience of others that the extra cost in question was comparatively low. In a previous article of this series, an example was given of an industrial plant of which two different designs were shown; one a perfectly plain utilitarian treatment of the building and the other a moderately or-

nate treatment of the building, intended to make it beautiful and attractive. On the basis of these two designs, builders' estimates were taken, and the actual difference in cost was found to be five per cent. of the total cost of the building.

The results of the experience of various architects with these problems in different cities have been secured, and they all go to establish the fact that the extra cost of what is commonly referred to as an ornamental treatment of an industrial plant does not, according to the current methods of designing plans in this way, involve an extra expense of more than five per cent. of the cost of the buildings.

In the case of Sears, Roebuck & Co.'s plant, an estimate has been made from the records of the contracts and it has been found that if the plant had been built purely as an engineering and scientific problem strictly adhering to the utilitarian requirements, by omitting the sunken garden, the athletic fields and all



TESTING LABORATORY—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.

Nimmons & Fellows, Architects of Original Plant.

George C. Nimmons & Company, Architects of Additions to Original Plant.



PNEUMATIC TUBE ROOM—SEARS, ROEBUCK & CO.'S PLANT, CHICAGO.
 Nimmons & Fellows, Architects of Original Plant.
 George C. Nimmons & Company, Architects of Additions to Original Plant.

the attractive features of the grounds, if the buildings had been faced with common brick, in box-like forms, to enclose the floor space required, and if all the terra cotta, stone work and other materials used to make them attractive had been omitted, a saving of considerably less than five per cent. of the original cost would have been made.

The chief benefits gained at Sears, Roebuck & Co.'s plant from the ornamental nature of the grounds and buildings and from the welfare work are, of course, to be looked for in their effect upon the employees.

It is difficult, of course, to give any adequate conception of the great improvement and uplift in their mental, moral and physical condition, but there is one way by which to measure the value of the results in dealing with employees: that is by the "turnover" of labor. In the previous article it was

shown that the best authorities agree that during the period previous to the declaration of war by this country, the average turnover of labor was 100 per cent. per year; that is, a concern was obliged to hire as many employees every year as was on its pay roll in order to keep the working force up to requirements. The investigation by Mr. Alexander was given, based on careful records kept at twelve typical industries in six different States; these showed a little over 100 per cent. labor turnover in a year. The statements of Prof. Roy Wilmarth Kelley, of Harvard University, and Dr. Joseph H. Willits, of the University of Pennsylvania (both authorities on the subject), were to the effect that the average turnover of labor in this country was about 100 per cent. a year. The study by Mr. Boyd Fisher, of Detroit, indicated the great extent to which this labor turnover had grown during the war. The

records of fifty-seven concerns in Detroit had shown an average labor turnover of 252 per cent. for the last year.

In the case of Sears, Roebuck & Co., the turnover of labor was not anything like as great as this amount during the war. Prior to the entry of this country into the war, when the labor turnover generally was running 100 per cent. in the industries over the country, the labor turnover at Sears, Roebuck & Co.'s plant in the year 1915 to 1916 was 57.8 per cent. On account of the necessity in their business each year of taking on a large temporary force to help out in disposing of the big rush of business at Christmas and one or two other seasons, this percentage should be reduced at least 15 or 20 per cent., in order to put it on the same basis for comparison with the other industries alluded to. This would indicate that the labor turnover at this plant was at least less than half of what it was generally over the country.

According to the leading authorities, the cost to replace an employe runs from \$25 to \$500, according to the nature of the work and the circumstances connected with it.

Assuming that the labor turnover at Sears, Roebuck & Co.'s main plant in normal times was half of what it was at the average plant generally, and that the number of employes was 16,000, then the turnover of labor must have been approximately 8,000 employes, which is 8,000 less than would be expected by applying the general rule established for such labor fluctuation. In other words,

it can fairly be assumed that by reason of the relations established with employes the firm is saved the annual expense and disadvantage of replacing 8,000 employes. This, estimated at the very conservative figure of \$50 an employe, amounts to a saving of \$400,000 a year.

It may seem difficult to accept these large figures as the cost of replacing employes, and yet the best authorities in the country who have accumulated accurate data on the subject, maintain that they are approximately correct. Assuming then that these calculations are approximately correct and that the labor turnover at Sears, Roebuck & Co., prior to the war, was running about half of what it was at other plants, generally, then this saving of \$400,000 which resulted to them in having only half as much labor turnover as other plants is one of the returns which should be credited to the well organized and well maintained welfare work of their plant. It is a sum practically saved every year that is in itself far greater than was expended in all of the welfare work instituted when the plant was originally built.

What the increase among the employes is in efficiency, in health and prolongation of life, in loyalty and in contentment and the joy of working where right treatment prevails need not be computed; its value is apparent, and serves as an example of the important share which right surroundings and right treatment of employes have in the development of American industries.

The SOCIAL CENTER

PART II

Philanthropic Enterprises

By

FISKE KIMBALL

THE inability of unskilled workers, sweated tenement dwellers, and others who most need a common meeting ground to support even a semi-endowed organization has, in the absence of civic action, thrown the task of providing decent social centers for the masses upon philanthropic agencies. Among these are many of a religious character, yet in so far as they seek to minister to a wider public than that of their own denomination—and this is almost necessarily the case when their field is among the foreign-born—the social rather than the ecclesiastical phase must dominate, and the buildings tend to conform to those of agencies without religious features.

Any wide recognition on the part of more favored classes of the need for social provisions among the poor of great cities began with Walter Besant's novel, "All Sorts and Conditions of Men," published in 1882. Its vision of a popular art gallery, concert hall, museum, and social club was realized in a wave of charitable enthusiasm which established the "People's Palace" in East London. The distrustful and disappointing reception which this received at first from its intended constituency, however, showed the danger of trying to "do something" for the poor, and of working on a preconceived notion of their needs. It emphasized that the first gift demanded was the gift of self.

It was on this idea of personal consecration on the part of educated men and

women, who should voluntarily take up their residence in the crowded quarters of cities in the hope of providing social and civic leadership that Canon Barnett in 1884 founded Toynbee Hall in Whitechapel, the first social settlement. That it met a need is shown by the rapid spread of the movement and by the multitude of settlements today. In America, where the foreign-born specially need friendly help, these settlements numbered four hundred and thirteen in 1911, and have still tended to increase. They form the principal class of social centers on a philanthropic basis.

Unlike the Young Men's Christian Associations and related societies they do not have a standardized form of organization and a relatively fixed program of activities; on the contrary, they have intentionally proceeded by constant individual experiment, undertaking this activity or that as the needs of the particular neighborhood have suggested. Clubs for boys and for girls, groups for discussion of social and economic problems, conduct of game rooms, playgrounds, and gymnasiums, of kindergartens and day nurseries, of lunch and rest rooms, instruction in domestic science, handicraft, art, dancing, music, and dramatics, maintenance of district nursing and dispensary work, savings banks and legal aid, agitation for political, industrial, and housing reform, all may fall among their activities, in varying combinations. The absence of any large initial means and the necessity of

proceeding slowly to win and keep the confidence of the neighbors, moreover, has tended to keep the settlements in old buildings erected for other purposes and to discourage the formation of a uniform architectural type. The quadrangle type was adopted at Toynbee Hall on the suggestion of the English colleges from which its residents came, and was the one advocated by Mr. Allen B. Pond, in the most notable early discussion of settlement architecture, on the analogy of the missionary monastic houses. Aside from its extravagance, and ordinary impracticability under urban conditions, however, it has been rightly felt to be unsuited to the spirit of the settlement, which faces outward rather than inward and seeks to assimilate itself as closely as possible to the conditions of life in the neighborhood.

Among settlement buildings which are the result of remodelings and of gradual growth there are features which have none the less architectural interest. Thus

the assembly room at the headquarters of South End House in Boston suggests what may be done on the interior in remodeling two large old residences for settlement purposes.

No case of the sort is more notable than Hull House, the most famous of American settlements, which has grown from the single old mansion which gave its name to cover an entire city block. It is a congeries of buildings and courts, with little possibility of close coordination of units for related functions owing to the constant moving into larger quarters of this or that activity which has outgrown its accommodations. The order in which the older blocks were built is indicated by the numbers in circles on the plan, but it must be understood that not only the use of these blocks but in several cases their interior arrangements have been modified more than once. Their architectural lines also, with the story heights and scales adapted to widely different functions,



ASSEMBLY ROOM—SOUTH END HOUSE, BOSTON, MASS.
Peabody & Stearns, Architects. Misses Lois L. Howe and Manning, Associated.

could not always be unified in the formal sense, but there has resulted an absence of institutional character, and an effect of true picturesqueness—never secured but by frank adaptation to imposed conditions—which the architects assuredly would not exchange for a more banal formality.

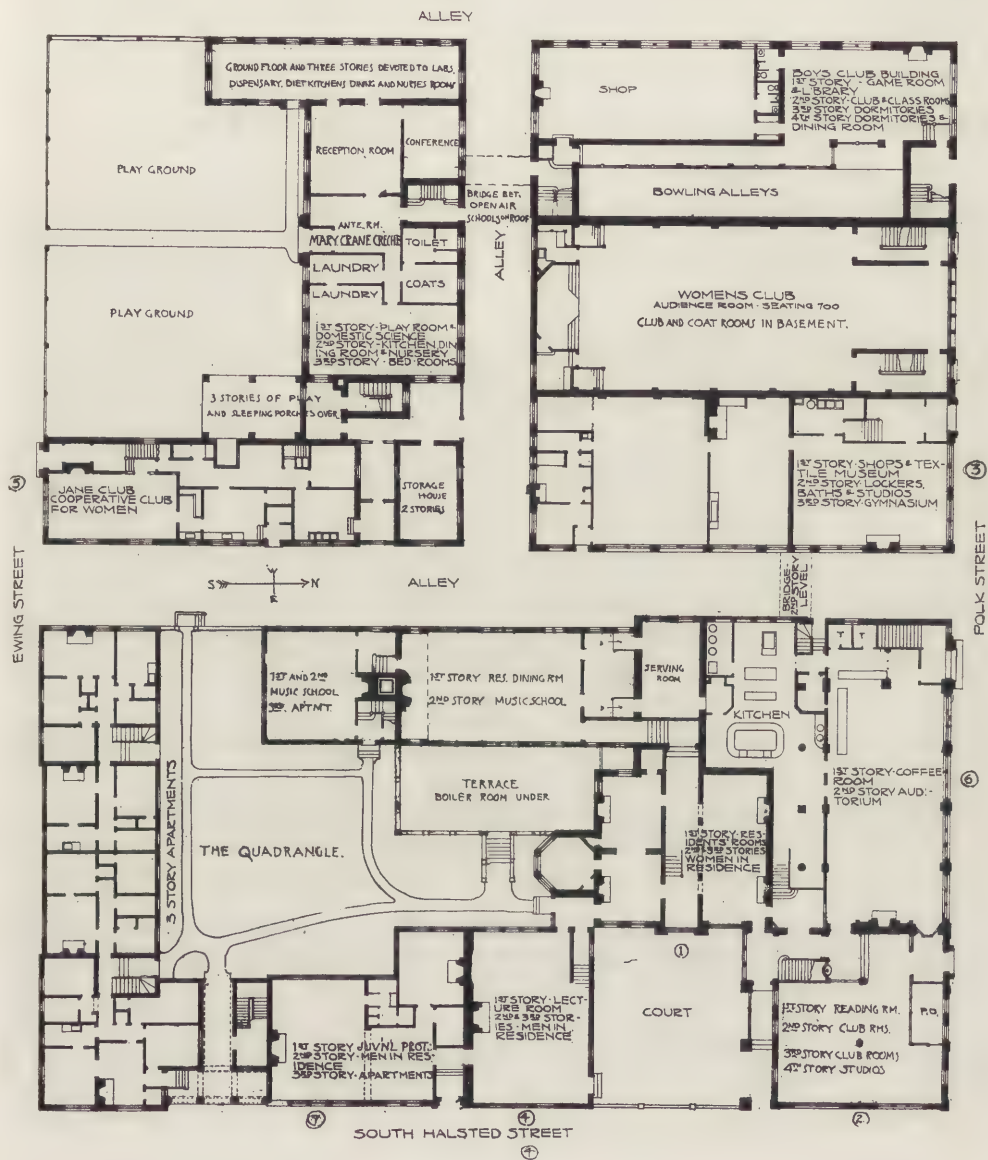
The group, the early history of which was traced by one of its designers in the *Brickbuilder* for September, 1902, now has the following accommodations and arrangements. The old mansion, which still houses the administrative offices and the residents' social rooms, fronts a small entrance court on Halsted street and opens to the south on a terrace backed by the large residents' dining room. The bed rooms of the women in residence occupy the second and third stories of the old house, while the men residents are provided for in the upper stories of adjacent buildings. To left and right of the entrance court are a lec-

ture room and a reading room with the rooms for men's clubs above. Adjacent to the old house on the north is a block containing the public restaurant or coffee-room, with its kitchen serving also the residents' dining room, and, above, an auditorium with a small stage for theatricals. Next in order along Polk street come the shops and gymnasium, the Women's Club with a larger auditorium, seating seven hundred, and the Boys' Club with game room, bowling alleys, class and club rooms and dormitories. At the south corner of the front is a block of apartments—for both married residents and neighborhood dwellers—designed to furnish by their rentals an income toward the maintenance of the House. It forms two sides of an interior quadrangle completed by the main house and the school of music, which has an old world air very unusual in this country. To the south, along Ewing street, follow the residence club for



POLK STREET FLANK WITH COFFEE ROOM, GYMNASIUM, WOMEN'S CLUB AND BOYS' CLUB—HULL HOUSE, CHICAGO.

Pond & Pond, Architects.



PLAN OF HULL HOUSE, CHICAGO.
Pond & Pond, Architects.



ENTRANCE TO APARTMENTS AND QUADRANGLE—
HULL HOUSE, CHICAGO. POND & POND, ARCHITECTS.

working girls, and the day nursery, diet-kitchens, and dispensary.

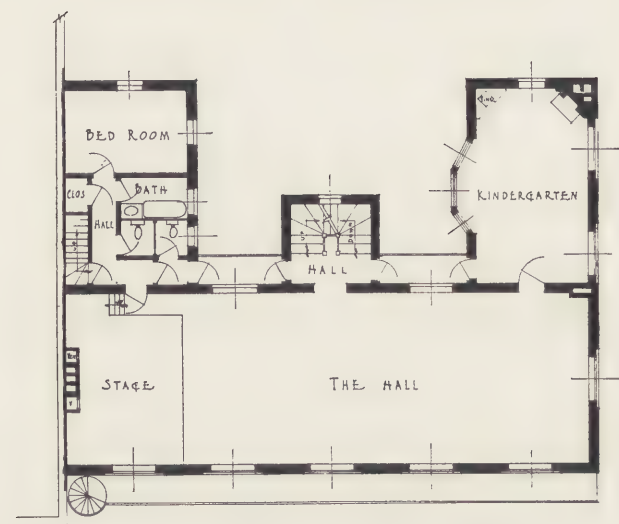
Some settlements where the headquarters have remained in old dwellings, instead of keeping their entire plant centralized as at Hull House, have erected the various supplemental elements as separate units. Thus to fill the need for social meeting places under decent conditions the Henry Street Settlement in New York took the initiative in erecting Clinton Hall, an independent structure with meeting rooms for trade unions, lodges, and benefit societies, an auditorium and dance hall, pool rooms, bowling alleys, dining halls, and kitchens, with provisions for the Kosher preparation of meals. In summer there is a roof garden, with a stage for theatricals. All told the patrons number some five or six hundred thousand a year. The Neighborhood Playhouse, well known as an independent "little theatre," is an offshoot of the same settlement.

The plan of scattering the various units throughout the district has been followed especially by South End House in Boston, with a view to providing "separate centers of influence so as to attack the needs of the neighborhood from different angles and at very close range." The buildings here include, beside the director's house and the separate residences for men and for women workers, a boarding club, the South End Music School and the South Bay Union. This last was specially constructed to meet the needs of its neighborhood, a congested factory and tenement quarter already provided—largely through efforts of the settlement—with municipal baths and gymnasium. It contains a lunch room, noonday rest rooms, a kindergarten, reading and club rooms for men, a small industrial school for boys and girls, and a "neighborhood town hall," designed to help the district achieve civic unity.

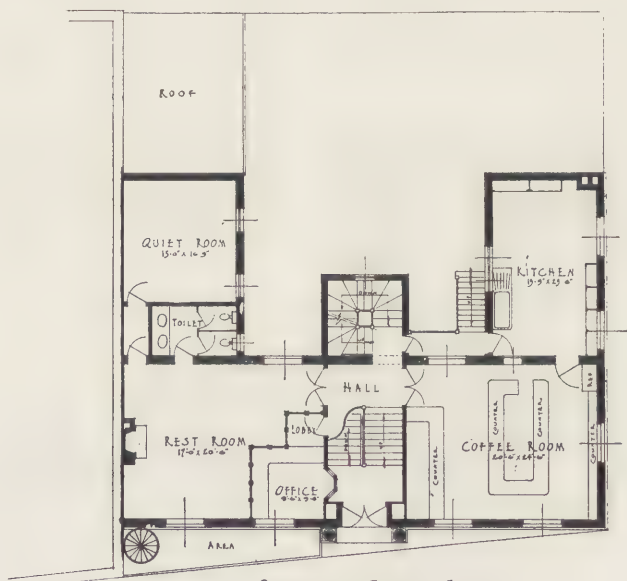


THE QUADRANGLE WITH SCHOOL OF MUSIC, RESIDENTS' DINING ROOM AND PART OF THE OLD HOUSE—HULL HOUSE, CHICAGO.

Pond & Pond, Architects.



PLAN OF SECOND FLOOR



PLAN OF FIRST FLOOR

Scale 1/8" = 1'-0"

SOUTH BAY UNION, BOSTON. R.
CLIPSTON STURGIS, ARCHITECT.

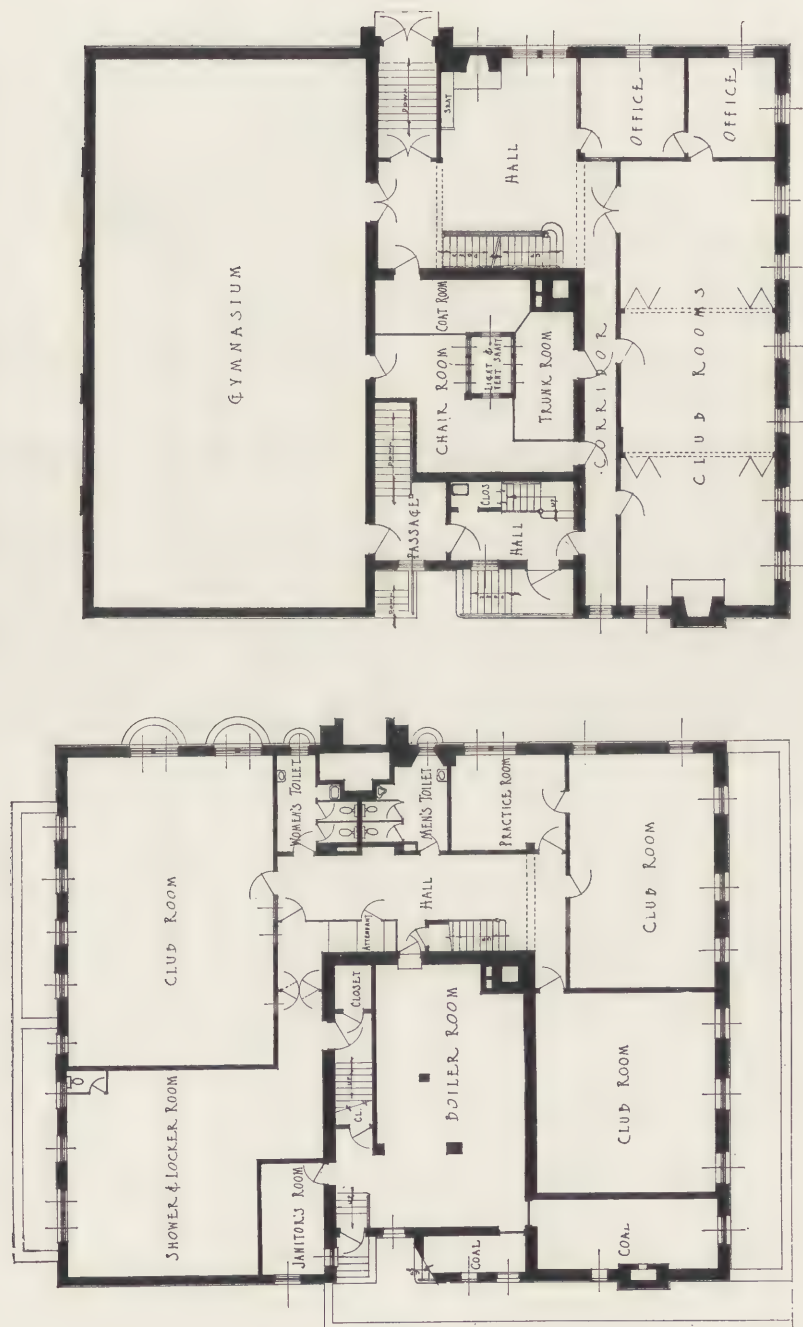


SOUTH BAY UNION, BOSTON, MASS.
R. Clipston Sturgis, Architect.

Among the self-contained settlement buildings erected for the purpose—relatively few in number—one characteristic of the simpler type is the Gad's Hill Center in Chicago. The problem architecturally is not greatly unlike that of a small Y. M. C. A. building, with offices, social rooms and gymnasium on the first floor, locker rooms and club rooms in the basement, dining and other club rooms on the second floor and bedrooms on the third floor. Great skill has been shown in securing the utmost utilization of space while providing for separation of functions and for every convenience of access. Thus the first floor, seventy by eighty-five feet, is built over practically solid, with coat room, chair room and trunk room occupying the center, illuminated by a small light-well. The office commands the entrance, the stairs both up and down, the gymnasium en-

trance, and the corridor serving the social rooms when separated for clubs. The kitchen on the second floor serves both the residents' dining room and the club rooms there, as well as those below by means of the service stairs. The rooms for men and for women residents, reached by separate stairways, occupy wings along the two outer sides of the block, with a suite for the head resident on the corner.

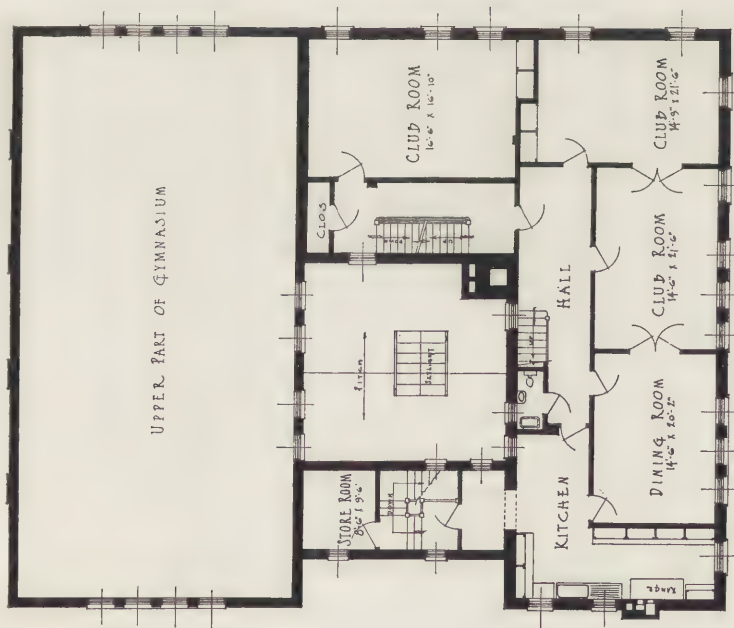
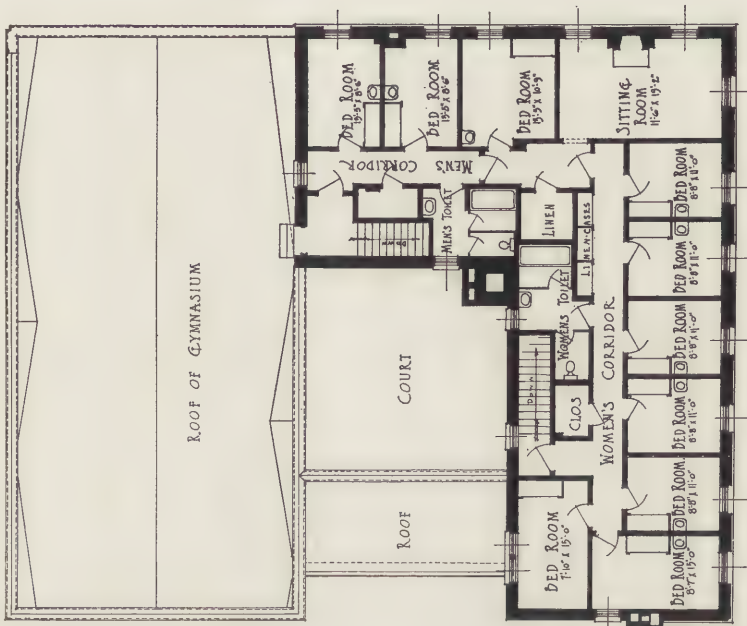
Notable among recently constructed settlement houses is Greenwich House in New York, equally interesting from the practical and the artistic viewpoint. Real estate values imposed a height of seven stories on a lot seventy-five by eighty feet, but domestic feeling has been maintained by a high-gabled Georgian treatment of the "head-house," while ample natural light is secured for the rear wing by courts at either side. The inclusion



PLAN OF FIRST FLOOR

PLAN OF BASEMENT
SCALE 1/8" = 1'-0"

GAD'S HILL CENTER, CHICAGO.
Pond & Pond, Architects.

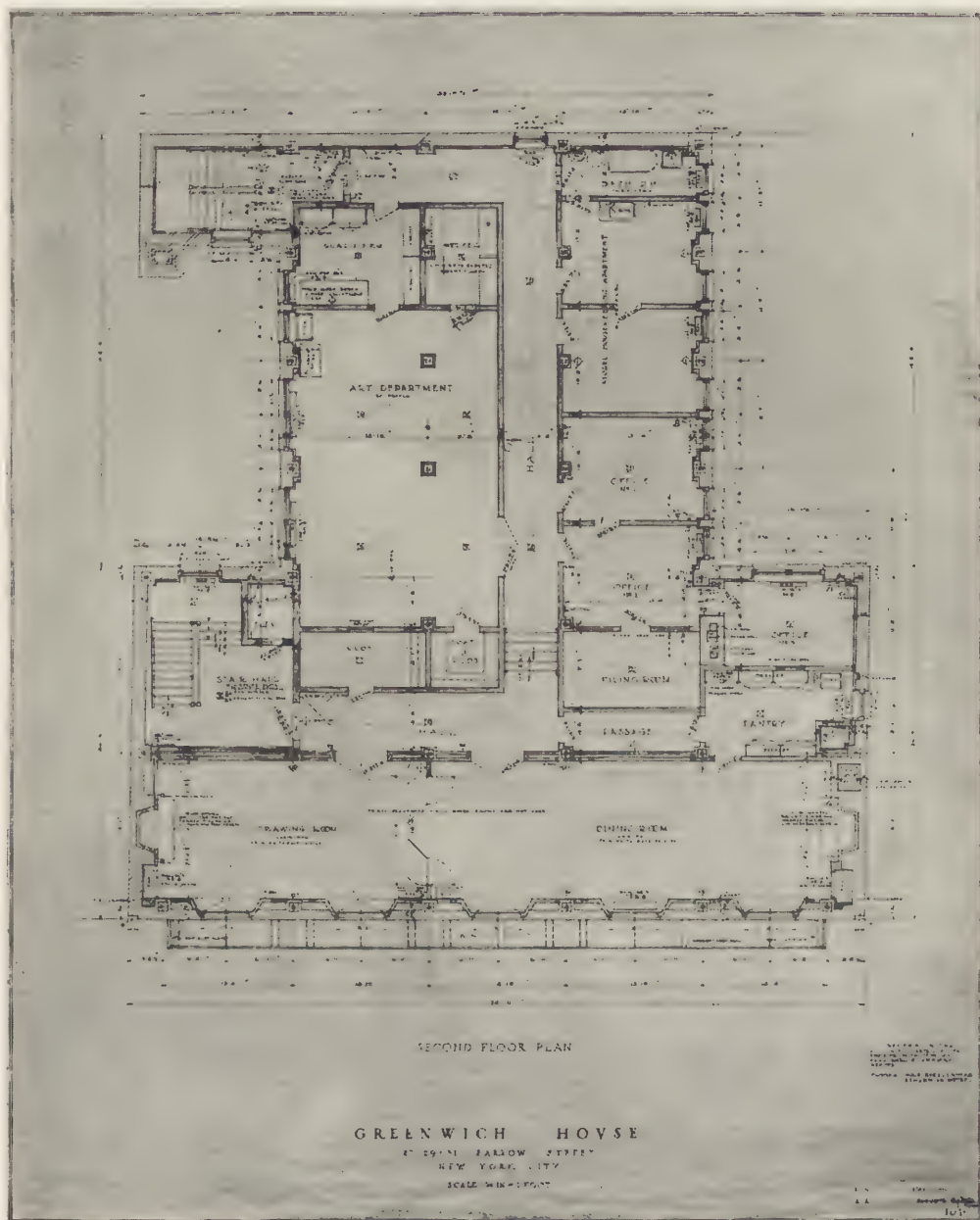


PLAN OF SECOND FLOOR

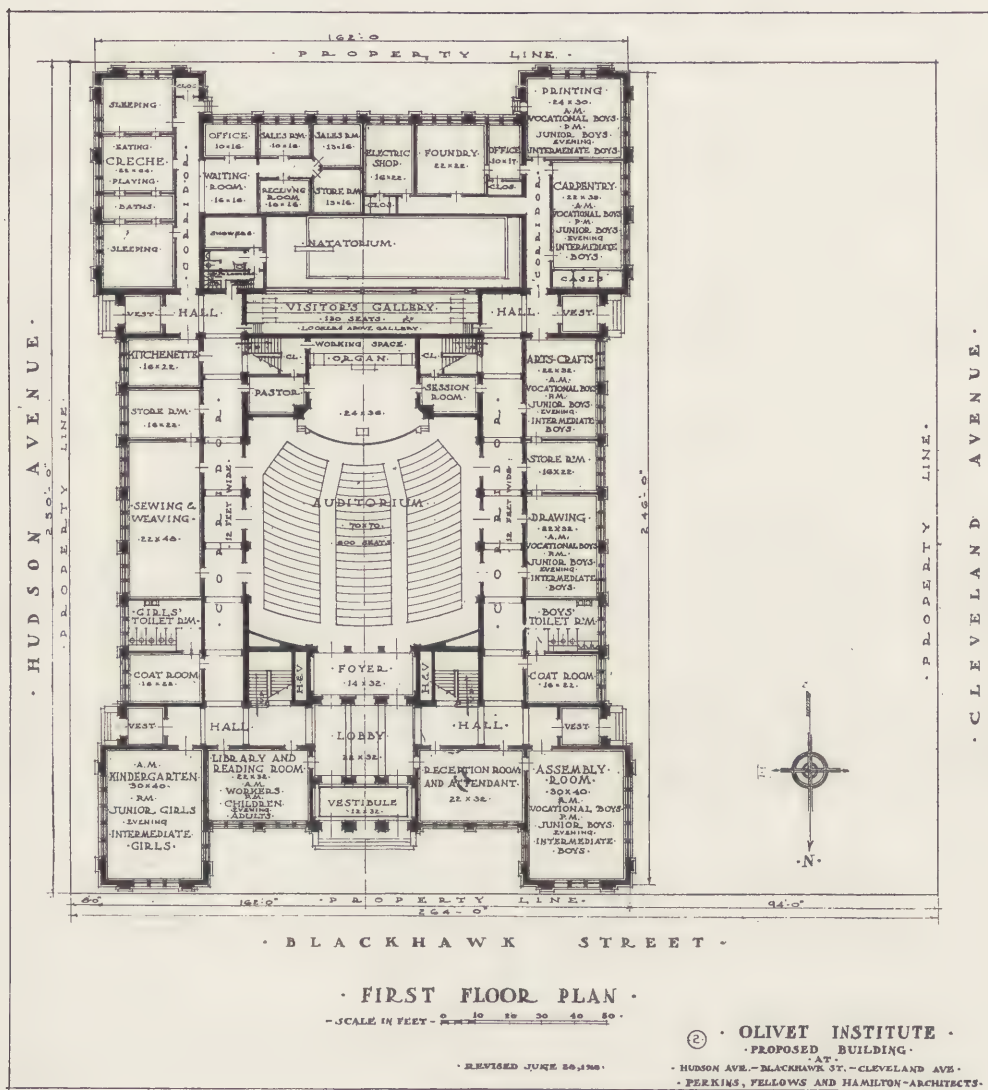
PLAN OF THIRD FLOOR

GAD'S HILL CENTER, CHICAGO.

Pond & Pond, Architects.

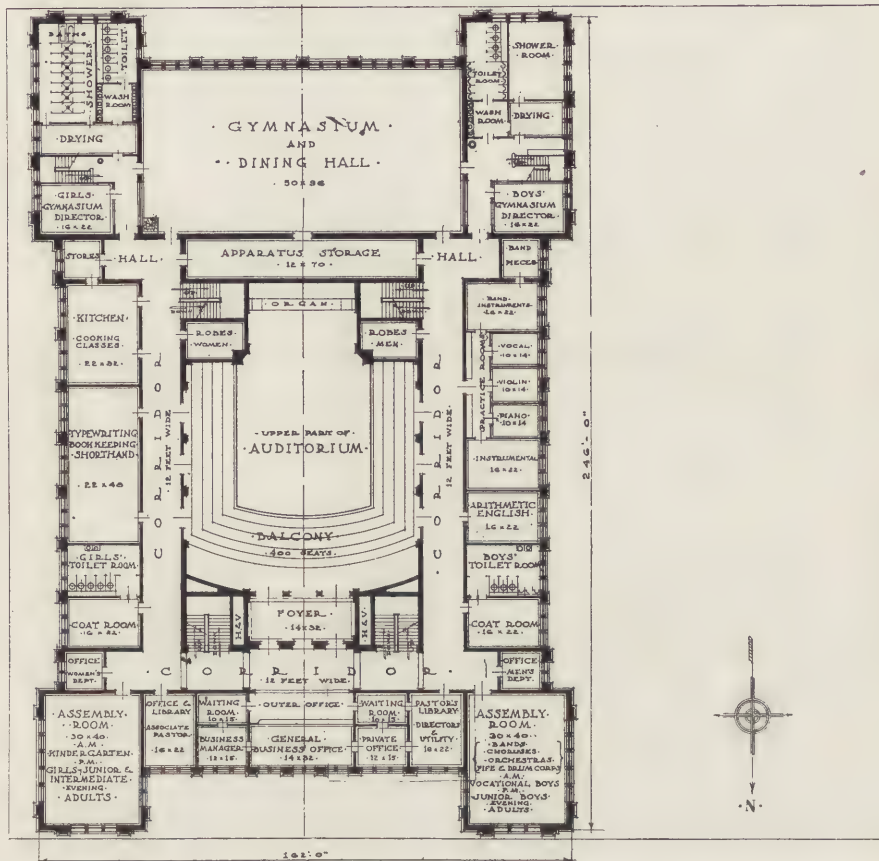


SECOND FLOOR PLAN—GREEN-
WICH HOUSE, NEW YORK CITY,
DELANO & ALDRICH, ARCHITECTS.



HUDSON AVENUE.

CLEVELAND AVENUE



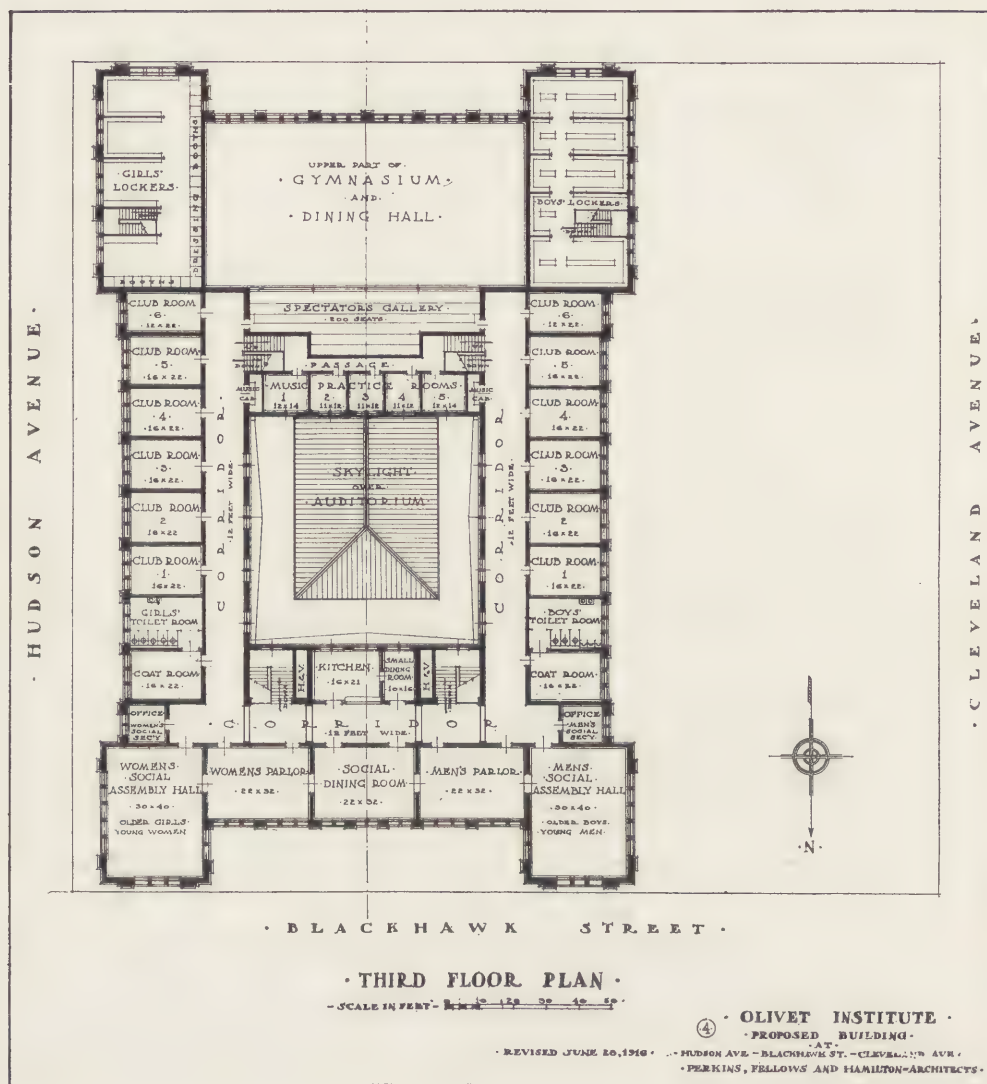
BLACKHAWK STREET.

SECOND FLOOR PLAN.

SCALE IN FEET - 0 10 20 30 40 50

② OLIVET INSTITUTE - PROPOSED BUILDING.

REVISED JUNE 10, 1910. HUDSON AVE. - BLACKHAWK ST. - CLEVELAND AVE. - PERKINS, FELLOWS AND HAMILTON-ARCHITECTS.



of an auditorium for theatricals, subject to the New York fire laws, largely determined the interior disposition, since it had of necessity to occupy the ground story. The foyer in front is also the reception hall, with a fireplace at one end and two retired alcoves. A first-aid room occupies one corner, with stairs to the clinic in a mezzanine. The second floor has the offices, the long main dining room and drawing room across the front, the art department, and a model house-keeping apartment. Then follow in order floors devoted to girls' clubs, to residents' rooms, to boys' clubs, to the gymnasium and track, and finally a roof garden with an open air school and a terrace for convalescents. The basement has a carpenter shop and a potter's kiln, for the Italians of the neighborhood are eager for art instruction and apt in creating beautiful wares. By electric connections there are facilities for cooking and service on every floor, so that any club may serve tea or supper.

Very unusual results have been secured by enlisting the unique artistic forces of the neighborhood for the decoration of the house. For the façade Mrs. Harry Payne Whitney has modeled four medallions, while the principal interiors have been decorated in color. The entrance hall, painted by Eugene F. Savage, has lunettes and panels of conventional peacock and flower groups in clear vivid color. Over the fireplace is a ship with all sail set. In the auditorium, done by Arthur Crisp, the woodwork is mauve-lavender, the walls white with vases of fruit and a multitude of joyous squirrels, long-legged birds, monkeys, and elephants. The dining room, by Augustus Vincent Tack, has dado and trim of deep blue with fanciful landscapes in the chimney recesses.

Perhaps the most comprehensive single building for social purposes yet proposed in America by any philanthropic agency is the projected one for the Olivet Institute in Chicago. This organization is an outgrowth of religious institutional work, yet the architectural provisions do not differ essentially from those needed where there are no religious affiliations. A large auditorium used for church ser-

vices on Sundays and Thursdays indeed occupies the center of the plan, but this might equally be the case where a public forum or dramatic activities were important. Unlike the settlements proper, but like many neighborhood "centers," the building has no residential apartments. On the social, recreative and educational sides, however, it is very highly developed. At the rear of the auditorium are a gymnasium and swimming pool, while on the other three sides it is surrounded by a twelve-foot corridor, having the reception rooms, assembly rooms, reading rooms and offices at the front, and the other provisions at the flanks, with a general division of the sexes to left and right. Thus the kindergarten, day nursery, and school of domestic science, shorthand and typewriting occupy the two lower stories at the left; the shops for vocational training, draughting rooms and school of music the corresponding quarters on the other side. The girls' and the boys' locker rooms are similarly located on either side of the gymnasium. On the third floor small club rooms occupy each flank. At the cost of rendering the plan *un peu mêlé* and of complicating supervision, the concentration of so many activities in a single building makes possible economical utilization of the rooms during three periods a day, and flexibility in the growth of different departments. On the exterior the educational character dominates, and gives the building rather an "institutional" aspect, not always considered desirable in buildings of the sort.

It is scarcely possible to overestimate the service which the settlements and related agencies have done, not only for the poor but for the community at large. It is chiefly to their workers that we owe any exact and sympathetic knowledge of urban life, poverty and overcrowding which have made possible intelligent efforts at amelioration on a larger scale. From their initiative largely have come the successful agitation for district and school nursing, milk inspection, legal aid service, small parks and playgrounds, housing legislation, and against unemployment, sweating and child labor.

Admirable as their work has been, and

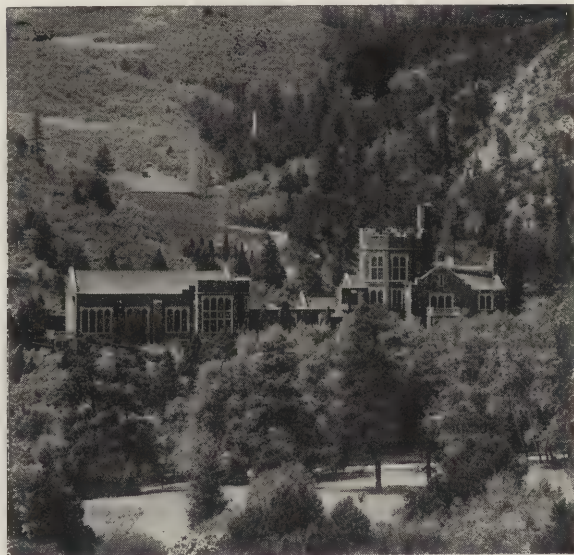


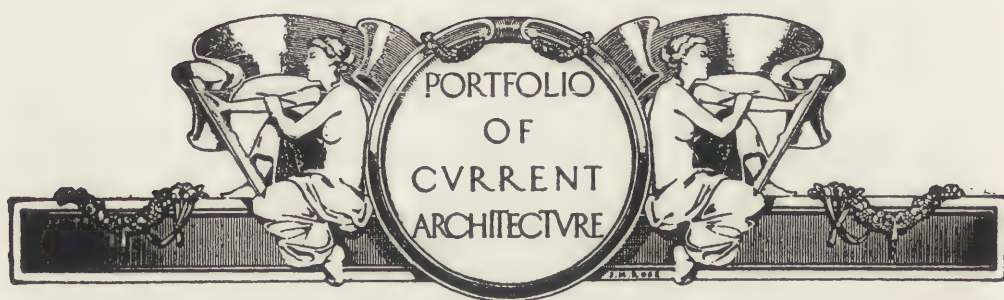
□ PERKINS, FELLOWS AND HAMILTON, ARCHITECTS

□ OLIVET, INSTITUTE

necessary as it will remain for a long time to come, there have not been wanting critics among the workers themselves, who point out certain elements of weakness and of self-destruction in the movement, which render its future uncertain. Aside from the tendency of the subjects of all philanthropic enterprise to resent that something is being done *for* them by others of better fortune—a tendency largely overcome by the tact and devotion of the settlement workers—there is the defect inherent in the very idea of the settlement: that a band of cultured outsiders could become at will neighbors of the poor while maintaining conditions of life and internal association artificial to the slums. Only an exceptional enthusiasm and

human warmth, which in the long run cannot be counted on, have overcome this difficulty, which increases just in so far as special buildings are provided. Even more striking is the tendency of the settlements to depart from this original emphasis on personal consecration to the service of individuals and to lay emphasis on the improvement of the whole social and economic mechanism by political action. In so far as this is successful, or even in so far as the practical activities initiated by the settlements are taken over on a more comprehensive scale by civic agencies, the *raison d'être* of the settlement tends to disappear. Thus the ultimate glory of the settlements will be to have rendered settlements unnecessary.

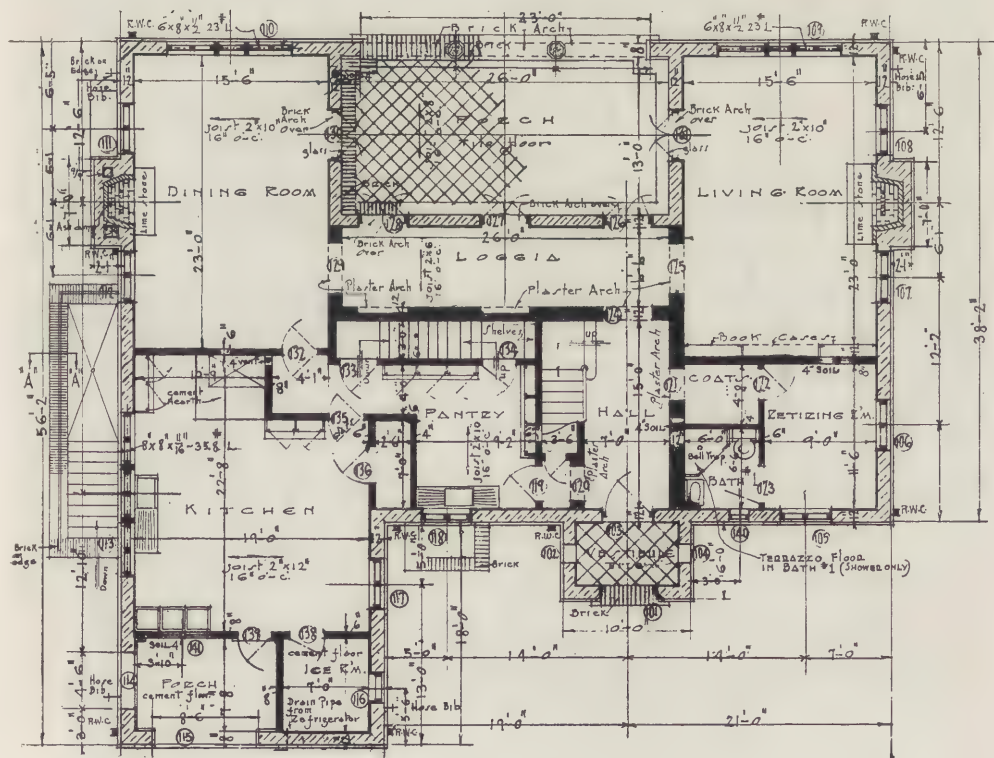




ENTRANCE—HOUSE OF MRS. HENRY A. DALLEY,
ARDMORE, PA. TILDEN & REGISTER, ARCHITECTS.



EAST FRONT—HOUSE OF MRS. HENRY A. DALLEY, ARDMORE, PA.
Tilden & Register, Architects.



GROUND FLOOR PLAN—HOUSE OF MRS. HENRY A. DALLEY, ARDMORE, PA.
Tilden & Register, Architects.



WEST FRONT—HOUSE OF MRS. HENRY A. DALLEY,
ARDMORE, PA. TILDEN & REGISTER, ARCHITECTS.



STAIRCASE—HOUSE OF MRS. HENRY A. DALLEY,
ARDMORE, PA. TILDEN & REGISTER, ARCHITECTS.



SERVICE ENTRANCE—HOUSE OF EDWARD SWAIN, ESQ., CHESTNUT HILL, PHILADELPHIA.
C. Wharton Churchman, Architect.



NORTHWEST AND NORTHEAST FRONTS—HOUSE OF EDWARD SWAIN, ESQ., CHESTNUT HILL, PHILADELPHIA.
C. Wharton Churchman, Architect.



LIVING ROOM—HOUSE OF EDWARD SWAIN, ESQ., ARDMORE, PA.
Tilden & Register, Architects.



DINING ROOM—HOUSE OF EDWARD SWAIN, ESQ., ARDMORE, PA.
Tilden & Register, Architects.



DOORWAY IN SUN ROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA. DUHRING, OKIE & ZIEGLER, ARCHITECTS.



SUN ROOM—HOUSE OF JOHN D. McILHENNY,
ESQ., GERMANTOWN, PHILADELPHIA.
DUHRING, OKIE & ZIEGLER, ARCHITECTS.



SUN ROOM—HOUSE OF JOHN D. McILHENNY,
ESQ., GERMANTOWN, PHILADELPHIA.
DUHRING, OKIE & ZIEGLER, ARCHITECTS.



MANTEL IN GALLERY—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA. DUHRING, OKIE & ZIEGLER, ARCHITECTS.



GALLERY—HOUSE OF JOHN D. McILHENNY,
ESQ., GERMANTOWN, PHILADELPHIA.
DUHRING, OKIE & ZIEGLER, ARCHITECTS.



DRESSING ROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA.
Duhring, Okie & Ziegler, Architects.



DRESSING ROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA.
Duhring, Okie & Ziegler, Architects.



BEDROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA.
Duhring, Okie & Ziegler, Architects.



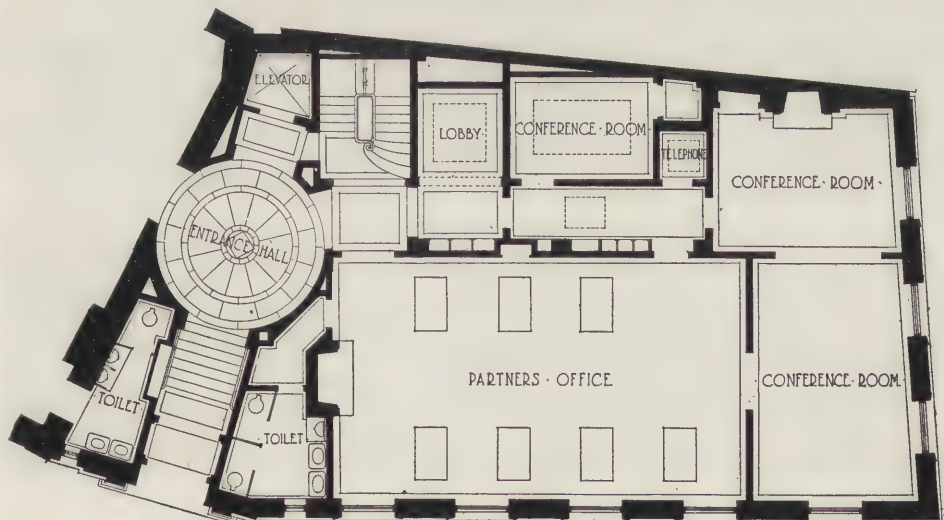
BEDROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA.
Duhring, Okie & Ziegler, Architects.



MANTEL IN BEDROOM—HOUSE OF JOHN D. McILHENNY, ESQ., GERMANTOWN, PHILADELPHIA. DUHRING, OKIE & ZIEGLER, ARCHITECTS.



VIEW OF BROWN BROS. & CO.'S BUILDING, NEW YORK.



FIRST FLOOR PLAN—BROWN BROS. & CO.'S BUILDING, NEW YORK.
Delano & Aldrich, Architects.



ENTRANCE—BROWN BROS. & CO.'S BUILDING,
NEW YORK. DELANO & ALDRICH, ARCHITECTS.

THE BASILICA OF SAINT REMY *at* RHEIMS



By Clement Heaton

WHAT is more beautiful than those old buildings lying in the highways and byways of France and Italy, buildings once the center of an active life, but now the silent and almost unused remains of bygone ages!" These words were written ten years ago concerning the Church of Saint Remy, which was in existence until a German shell exploded in the building.

As soon as the dust and smoke had cleared away, what had been a noble relic of the past was but a heap of blackened ruins. Yet under the stones and dust was the crypt. There in the darkness was the golden shrine or casket containing the remains of Saint Remy, Patron Saint of Rheims.

While the shells were still falling, three French officers brought the shrine from the crypt, which was still uninjured. It has now been removed safely to Chalon-sur-Marne.

Who was Saint Remy? How came the church to bear his name and when was it built?

The cities of Soissons, Laon and Rheims were more important as centers of art than Paris up to the twelfth century. Of these cities Rheims was the metropolitan center of an ecclesiastical province which extended to the coast of the English Channel.

The Romans had taken over the Gaulish city and made it a military center, where the general in chief of the Roman armies built a palace A. D. 370. During the Roman occupation prior to 313, Christian worshippers conducted the practices of their faith at Rheims as at Rome in a dark labyrinth of catacombs quarried under the surface of the earth. In the third century chapels existed here and there among the tombs, where

Betausius, a Greek Bishop of Rheims, officiated. But at the time when the palatial military headquarters were built, the edict of Milan in A. D. 313 had given legal recognition to Christian worship, and the churches of Saint Vitalis and Saint Agricola were built above ground in open daylight.

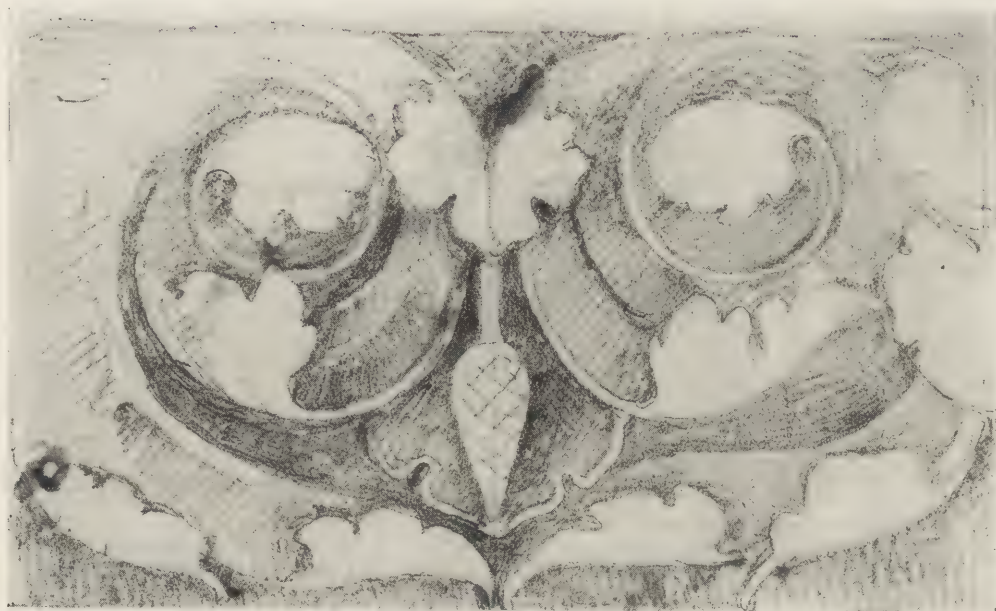
But by that time habits had been formed by many years of worship in the dark catacombs. The altar had evolved from the tomb of a martyr located in one of the small subterranean chapels. So, when the churches were built above ground, it was still the custom to build a dark cellar or crypt under the altar, resembling the catacombs, to which the remains of the early martyrs were transferred. This was the origin of the crypt, a symbol of former history. The lights necessary to worship in such underground interiors also remained, and all this was the case at Rheims.

A succession of Bishops continued from the time of the Greek Betausius. Of these, Remigius or Remy was the fifteenth. He was buried in A. D. 533 in the church then bearing the name of Betausius, but which has since borne the name of Saint Remy. From the renown of the Saint, the church became a center of pilgrimage, and as at Chartres, Canterbury and Vezelay, sumptuous buildings were later on provided in view of these crowds, erected from the proceeds of the offerings given at the tomb of the Saint.

The Basilica was first built between 600 and 638 on the model of S. Appollinare in Classe at Ravenna. It was one of the wonders of France. Its attractive influence continued to increase during the seventh and eighth centuries. Archbishop Turpin (756-802) introduced the Benedictine Monks at Rheims. So Saint



EXTERIOR OF THE CHURCH
OF ST. REMY AT RHEIMS.



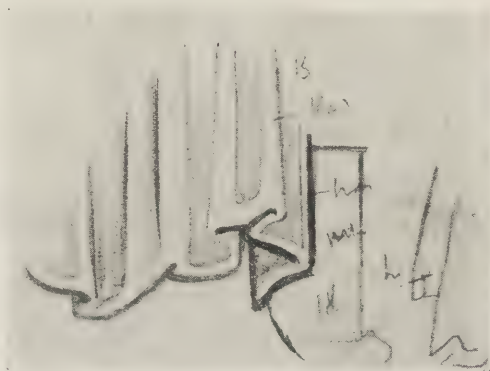
DETAIL OF CARVED STONEWORK, RHEIMS.

Remy became the church of the Monks of the Order of Cluny, at that time the most influential order of western Europe.

The Basilica was again rebuilt by Turpin, and Bishop Ebbon (816-835) continued the building then commenced. This was shortly after the death of Charlemagne, and his successor, Louis the Debonair, sent his chief mason, Romuald, to do the work. Bishop Hincmar (845-882) built a crypt, dedicated in 852. From this time forward the city became a royal burial place. King Robert was buried there in 922; Lothair, in 954, and the fame of the Church of Saint Remy was further consolidated from this fact. The church was reconstructed in 1005 by Bishops Thierry and Herimar. This was consecrated by Pope Leo IX in 1049.

While the Church of Saint Remy thus remained such an important center, the Frankish dynasty was sinking into insignificance. It was Anselm of Bec who described the consecration in his writing "Itinarium Leonis IX Papae." Bec was a Norman Monastery, and the Normans had become at this time the chief political power in this part of the world.

The earliest part of the Church that remained to our times was that built by Bishop Thierry in 1034; part of what



TREATMENT OF DRAPERY IN CARVED STONE.

was built in 1048 was, however, standing till destroyed by the Germans.

The apse, of which a photograph is given, was built by Pierre de Cellis (1162-1182). In the thirteenth century (1211-1311) the well-known Cathedral Church of Rheims was constructed near Saint Remy, after an earlier building had been demolished.

The monastery of Saint Remy was a center of learning, with a public school and library. This contained rich manuscripts and copies of the classic authors, and it was in this and other such places that early manuscripts of the classics



INTERIOR OF CHURCH OF
ST. REMY AT RHEIMS.



DOORWAY IN THE TWELFTH CENTURY CATHEDRAL AT RHEIMS.



TRIFORIUM OF THE CHURCH OF ST. REMY AT RHEIMS.

were discovered, and printed in existing editions. This was part of the movement of the Renaissance, and so the classics have been preserved for us.

A wonderful mosaic pavement was laid in the Church of Saint Remy in 1090, when art of this kind was the subject of so much keen interest. At the same period goldsmith's work with colored enamel was in highest esteem. So a golden shrine was thus made for the remains of Saint Remy, which was compared to the Shrine of Saint Ambrose at Milan. A golden chalice and part of a candelabrum in bronze have also remained from this period.

But in the eleventh century a new art arose of greater brilliance than that in gold and enamel—the art of figure work in stained glass. As Rheims was a center of learning and wealth, it was one of the first places in which this new art appeared. Bishop Adalbert, writing in the eleventh century, is the first who mentioned stained glass windows containing subjects: "*Fenestris continentibus di-*

versas historias." A monk of Zurich, Ratpert, wrote at the same time as Adalbert concerning the glass in the Fraumunster there: "*Sique fenestrarum depinxit plena colorum pigmenti laqueam.*"

These are the earliest mentions of stained glass known. From the eleventh century to the end of the twelfth, this was the rising art. It affected even the growth of architecture itself, which was modified by providing windows of larger size and in greater number. This is the probable reason why the Church of Saint Remy was built on a larger scale in the twelfth century. All its windows were then filled with figure work in stained glass, executed at this time, and they remained there till the church itself was destroyed. We are glad to learn that this glass was removed and has been preserved.

The photographs of the church and the glass are the only ones we believe existing in this country. They were made at Rheims and brought here by the writer before the war.

THE FUTURE OF INDUSTRIAL HOUSING

By Sylvester Baxter

WHEN industrial housing was taken so energetically and competently in hand by the Federal Government as an essential element in bending every possible resource towards the single end of winning the war, plans were made looking to a continuance of the work so long as it might be needed. How long, it was impossible to forecast. But whatever the outcome, one thing was practically assured. Unlike so many other war activities, the results would not eventually be a scrapheap of things for which, the war being over, there would be no further use. A great beginning—indeed, an unprecedented beginning—was made in dealing with a national problem of enormous importance, and there would be a continuing use for what had been achieved. With such a start, the momentum of the movement could hardly fail to carry it indefinitely on to consummations of vast significance.

Whatever turn may be given to the work, now that the early cessation of the war has brought abrupt changes and terminations into all this far-sighted planning, these consummations may still be looked for. Others, more sanguine, had looked to the carrying on of the work as a feature of the largely planned activities whereby the developments of our industrial resources, under the conditions and the tremendous demands that peace would bring, would be continued with an efficiency and a coordination of activities comparable with what the necessities of war had taught us to do. Hence, in this housing question, it was felt that the work might still proceed under some effective cooperation of Federal and local authorities. In times of peace it would remain a national question. The participation of the Federal Government, as represented by the extraordinarily efficient device of a United States Housing Corporation,

substituting business methods for political ones, would be well justified in view of the fact that the enormous economic waste represented by the drifting of labor, skilled and unskilled, hither and yon, is a national concern, affecting the whole country. With labor kept employed where most needed, simply by providing adequate and attractive housing at such points, a tremendous saving would be assured.

But the lessons of disaster are not so easily learned. So, although the war has taught us how to do many things as they should be done, when the urgency is over, the tendency is to lapse into the old slovenly and incompetent ways. The big, competent men, the masters of business and industry, who had come to the front to put things through as they had to be put through, went back to their own affairs. The greatest business of all—that of government, which ties all business together—reverted into the hands of politicians, who in the main know little about business. So in this housing matter curtailments and terminations of the work have taken place on every hand. Many admirable projects that deserved to be realized have been abandoned, although, if carried through, they would have met real needs. Work under contract and far advanced has been suspended; the contracts annulled. Projects of this sort will doubtless be in some way taken over and completed by local interests.

Nevertheless, so much has been done, and so finely done, that it cannot fail to have made a nation-wide impression, with results of high import in prospect. The term "housing" has taken on a new significance for the public; its practicality as an element in the great and world-wide movement for industrial betterment is now almost universally in evidence. As to town-planning, it now takes its place as a full-fledged profession beside

architecture and landscape architecture; its fundamentals drawn from both of its sister arts as well as from civil engineering. As a profession town-planning promises to enjoy in this country a development commensurate with that of another vocation that with us is still young. At the time of the Columbian World's Fair in 1893 Gifford Pinchot was the only professional forester in the United States. Forestry is now a widely practiced profession with ample opportunities in the service of large private interests, as well as with the Federal Government and numerous state governments with their extensive forest reservations. The national outlook for the exercise of town-planning as an art is correspondingly encouraging.

The appropriations placed at the disposal of the two great organizations concerned with housing-operations as war-measures—the United States Housing Corporation and the United States Shipping Corporation—reached a total of \$200,000,000. After due allowance for the unexpended balances, the expenditures thus made are represented by work so extensive, and so widely in evidence in numerous industrial communities throughout the country, that they can hardly fail to lead to remarkable transformations for the better in the aspect of these cities and towns. The example thus set will continue to make its influence felt in steadily augmenting degrees. The demand for keeping up these activities, so auspiciously begun, must inevitably persist in some shape. It is a vital question; the consideration of the methods best adapted to assuring the best results; economically, artistically, and to the greatest advantage of the workers and of the community at large.

What shape will the disposition and administration of the great housing projects undertaken by the Federal Government take? Federal ownership and operation had been definitely planned for only while the war lasted. But more or less thought has meanwhile been given to what may best be done with the properties when peace prevails. It seems hardly likely that Federal ownership and control will continue any longer than

is necessary after the completion of arrangements for the transfer of titles to new owners; either corporate or individual. Hitherto, collective housing activities in this country have with few exceptions been individualistic in their final aims, having regard almost exclusively either to the ownership of his own home by the worker or by the employing party. The great co-operative movements, that in recent years have become so important in Great Britain and Germany, have with few exceptions hardly touched our industrial life. This, for us, has been a weakness that, until these big housing undertakings of the Federal Government, has barred the way to the creation of such collective examples of model housing as the beautiful "garden cities" of England.

It has been said that co-operative activities do not accord with our "American genius." But perhaps this objection may have as its basis merely the fact that in the matters involved co-operation has never been really brought to the test. Our people have been given little opportunity to know anything about co-operative housing activities. Perhaps, if what has been accomplished abroad were laid effectively before them and its possibilities shown, such methods would appeal to them. Indeed, there is one form of co-operation that in the housing field has been a great success in this country in supplying the funds on easy terms for the building of individual homes: the co-operative loan and banking associations. In certain other ways, as in the co-operative marketing of fruit by fruit growers on the Pacific Coast, co-operation cuts an important figure in our industrial and economic life. The possibilities of well organized co-operative effort in increasing our economic efficiency are enormous, and as yet hardly touched.

The celebrated "garden cities" of England are largely due to the initiative of employers. Port Sunlight, near Liverpool, is one of the earliest examples of the sort. Others are co-operative in some form or other. There are also extensive instances of municipal housing, the municipality taking into its own

hands the solution of the menace of the slums, clearing away the undesirable constructions that encumber the ground in congested localities, replacing them with model dwellings and assuring a continuance of the improved conditions thus created by remaining permanently the landlord. Municipal housing is yet unknown in this country; our loosely managed cities have not the competency for dealing with such problems that has been achieved by British and German municipalities. But with the growth of the industrial-housing movement a steady advance in its encouragement in various practical ways by our municipalities may be looked for. One factor is the growing tendency to apply the principles of town-planning in providing for the intelligent growth of a community. Such plans will thus be shaped with reference to the needs of the housing projects as may be organized for this or that section of a city or town. Schools, playgrounds, parks, transit facilities and community centers will be provided with reference to such projects. Municipal encouragement along such lines has to no little extent already taken place in regard to the housing activities undertaken by the Federal Government. Such encouragement is, of course, a matter of self interest for a city or town; housing projects, when realized along these lines, are important assets for a community, increasing its taxable values, its good looks, and its general well being and attractiveness as a place to live in.

Industrial-housing activities on the part of manufacturing corporations date back to the early days of such undertakings in this country, now something like a century ago. It is, of course, a matter of prime interest that employes should be provided with dwellings within convenient reach of their work; individual enterprise could not often be depended upon for the purpose. Too frequently the old-fashioned mill-tenement was far from attractive; along with the "company store" it was likely to be a matter of abuse. Yet in the pioneer manufacturing centers of New England, like Lowell in Massachusetts and Man-

chester in New Hampshire, there is a notable and restful charm in the rows of red-brick "corporation houses" that face placid elm-shaded canals, suggestive of Amsterdam or Bruges. Of later date there are also scattered through the country many "model towns" established by great manufacturing concerns. Hopedale in Massachusetts, the work of the Ludlow Manufacturing Company near Springfield, in the same state, and the Pullman addition in Chicago, are typical.

The housing situation in Bridgeport is of the sort that a certain way of dealing with its continuation seems quite natural and correspondingly likely. A year or more before the Federal Government entered the field a good start had been made by the leading local manufacturing interests. These had organized the Bridgeport Housing Corporation; extensive building of homes for employes had been undertaken, as mentioned in a previous article. This corporation has thus had abundant experience and is correspondingly well equipped for carrying on the work. It would therefore seem the logical thing for the United States Housing Corporation—now that it appears to be settled that the Federal Government will withdraw from the field altogether as soon as practicable—to effect an agreement with the local housing company whereby the latter would take over the properties on equitable terms that would eventually reimburse the Government for its outlay with perhaps the exception of the proportion representing excessive war-time costs, that could be written off and charged to profit and loss, warrantably incurred as emergency outlays. In such transfer of ownership there could be stipulated provisions that would safeguard the interests of the workers in the way of reasonable rentals, etc.

Both the local and the Federal housing corporations have built on a large scale the two classes of dwellings: individual house (single, semi-detached and two-family flats) and apartment houses containing many units in one building. Different policies as to the final disposition of the respective forms of prop-

erty would naturally be adopted. It has been understood that the intentions of the local housing corporation have been ultimately to sell to the occupants on attractive terms the individual houses, as soon as post-bellum conditions had become normal, while the apartments would naturally remain the property of the company.

While no definite policy has been fixed for the United States Housing Corporation as to the final disposition of its property, the procedure most favorably considered, as along the line of the least resistance, appears to have been to transfer the ownership either to existing local organizations, or to such as might be formed for the purpose. Where corporations of the sort are composed of employers as in Bridgeport, the properties would naturally be likely to go to them. In this particular instance the work has advanced along such enlightened lines, both economic and artistic, that excellent results should be looked for. But it would seem highly desirable that the formation of housing-corporations for the purpose of taking over such properties, composed either of employees, or jointly of employees and employers, should be encouraged as strongly as possible. There are important organizations that have given much thought and practical attention to housing questions. To no little extent their leaders have been active in the Government activities, and their participation has been a notable factor in assuring the high and enlightened character of the work. Their influence should now be exerted in this direction. And the probabilities are that it will be. An encouragement of the co-operative spirit along effective lines should do much towards soundly shaping the industrial future of this country. With an intelligently practical and correspondingly substantial encouragement of voluntary co-operative activities on the part of the Federal Government—such activities to be co-ordinated with Governmental operations in various ways—the inevitable reorganization of our Government along efficient, economic and industrial lines in place of the decadent and incapable political lines of the present,

would be likely to advance with lessened friction and danger of disastrous rupture.

Under the adverse influences apparently now so influential with Congress, the prospects are that all constructive housing activities on the part of the Government will soon be a thing of the past; that little more than the winding-up of the business as soon as may be, can be looked for. Yet the adequate housing of the people is one of the most vital of elements in assuring the advancement of a great democracy towards the realization of the ideals essential to a progressive civilization. The least that should now be done is to encourage co-operative agencies for the control and administration of existing properties developed by the Government. And in view of the duty of our National Government to do its best to save the nation the enormous waste caused by the labor turnover due to unstable conditions of employment, it would be well if its housing activities were to be perpetuated in some shape and adapted to the conditions of peace. As in the task of organizing a national network of improved highways, the housing problem should be so dealt with as to be correlated with local and state activities. But if nothing more than a closing out of the business can be looked for at present, at least this should be done in a way that would encourage the continuation of the work in other hands.

We have seen that there are various forms of the co-operative organization of housing projects. Little has yet been done in this way in this country, although great advances have been made elsewhere. In turning the government projects over to local control and ownership might it not therefore be well to provide that the local organizations be shaped according to this or that co-operative method—some method that had elsewhere stood the test of practical application. We would thus have various object lessons in different parts of the country, and the ones that best commended themselves would be likely to come into general favor.

In cases where strong organizations of employers stood ready to take over the

government projects—as seems likely in Bridgeport, for instance—some form of co-operative participation for the employees might well be agreed upon. Employers have such a stake in the matter that it should prove much to their advantage to share in such undertaking in a way whereby they would subscribe for, or otherwise assure, a proportion of the capital needed for the undertaking. All these conditions might be formulated by the United States Housing Corporation. For the continued development of the projects thus taken over, and perhaps for new projects, some form of Federal participation or encouragement might be arranged for—as in giving such organizations the benefit of expert advice, or perhaps in advancing, on favorable terms, loans for construction. Should not loans to industrial workers be as much in order as loans to farmers? All this, however, would demand new legislation and would hardly apply to cases now in hand.

Individual ownership of homes has long been regarded as an ideal. It gives a man a stake in the community, promotes his interest and participation in public concerns, and tends to stability of employment. A man takes pride in the appearance of his own home and is likely to keep his house and grounds in better order than if he were a tenant. Yet the bulk of the population in our cities and towns remains tenants. Individual ownership of homes has its drawbacks. There is good real-estate expert testimony to the effect that ownership, on the average, is far more costly than rental, taking into account taxes, interest, depreciation, repairs, etc. In my own case, for instance, I have felt obliged to buy adjacent lands for the sake of preventing undesirable occupancy. Such things tend to make one "land poor." The increased cost of ownership as against tenantry may be charged to luxury: the satisfaction of maintaining and improving a home according to one's own pleasure.

These drawbacks of individual ownership, while retaining all its advantages, appear to be avoided in a plan of co-operation that has gained no little popularity in England. It was first tried

there by the co-operative organization known as the Ealing Tenants, Limited. Ealing is a suburb of London. In an undertaking of this sort a man is a tenant of the association, yet at the same time he is his own landlord by reason of the fact that when the loan that represents his participation has been paid up, his share in the property is practically the same that it would be if he owned his home individually. His rent is balanced by the dividends on his shares. The association looks after taxes, and outside repairs. The individual looks after inside repairs. With his neighbors he has a stake in the entire community through joint-ownership, and is thus made to feel his interest in the collective weal. The association protects him against objectionable neighbors by looking after the character of would-be tenants. He is not anchored to the spot by individual ownership of his home. If by reason of health, changed conditions of employment, or better prospects elsewhere, he has to live elsewhere, he is free to move. The association purchases his shares and sells them to some other person. Taste-ful environment is assured by the employment of good talent for designing the layout and the architecture.

"Landlord tenants" would be a good name for this form of co-operative home owning. The idea originated in Germany, where it was successfully applied to the co-operative building and ownership of large apartment houses, such as constitute the usual form of dwelling in Berlin and many other cities of that country. This plan ought to be effective anywhere, both for co-operative ownership of apartments and of individual dwellings. The United States Housing Corporation might for instance do good service by encouraging the tenants of the handsome apartment-houses it has been building in Bridgeport to form a co-operative association for joint ownership on this plan.

The object lesson in attractive housing for workers that have been scattered throughout the industrial centers of the land, by one of the most efficient agencies ever created to carry out a great governmental undertaking, can hardly

fail to make the housing question loom large in the near future. The demands thus created among our skilled and highly paid workers will have to be satisfied in some fashion. In view of the substantial and beautiful results thus set before them, they will be less and less contented with the flimsy constructions of speculative jerry-builders that so many of them are wheedled into purchasing.

These great housing projects of the Federal government have universally been carried out by contract, the contracting party undertaking the entire work: street construction, ornamental planting, house-building—everything complete and ready for occupancy. Enormous economies are effected by these wholesale methods. In the great developments in industrial housing that undoubtedly await us, there should be a vast field for great and competent contracting concerns accustomed to turn their hands at short notice to any form of construction-work. The difference between retail and wholesale methods, as represented respectively by the man who goes to a one-horse builder to get a house built for him, and the building operations on a great scale as they are now carried on, stands in the annual aggregate for an enormous economic waste. Houses will more and more be built by the wholesale. Why should not our big contracting concerns take the initiative and enter upon the virgin field that invites profitable cultivation? For some years, now, extensive land-operations have been carried on along similar lines: large tracts obtained and developed with streets, sewers, cement sidewalks, etc., all completed; the individual house lots ready for building by the purchaser. Why not go a step further and cover such an improved tract with dwellings attractively and substantially built to meet the demands of individuals?

An example of large-scale work of this sort, undertaken on a commercial basis, is that of a "town-planning and housing company" in Boston, that has chosen a large tract in Lexington, Massachusetts, for the scene of its first op-

erations in creating a "garden city." This is to be covered with 300 dwellings, built in groups of 100 at a time under supervision of competent architects and construction engineers. The program is to build on every lot on both sides of a street, using steam-diggers for grading lots and streets at one operation. Outside walls are built of cement-stone units and blendings of cement face-brick of various textures and colors, made on the premises. A portable mill cuts lumber to required lengths and saves waste in labor and materials. The roofing of red cement-tiles is also made on the premises. An aspect of completion is assured by finished lawns, cement walks, and the planting of shade trees and shrubbery. It is estimated that the cost of the work done in this wholesale fashion is less by one half than that of building in the ordinary way.

Might it not be good business for great contracting concerns to make a feature of work in this fashion and even formulate effective plans for cooperative ownership, securing on good terms funds for financing such projects, etc.? It is worth noting that in Italy, cooperative efficiency has been so far developed that federated associations of workers even do their own contracting on a large scale. The different building-trades are organized as units; in combination, financed by "Peoples' Banks," they go so far as to enter upon gigantic undertakings by contract. In Milan they have in this fashion contracted to build a great railway terminal at a cost, it has been stated, of forty million dollars, or more—doing the work under the supervision of architects and engineers engaged by themselves.

It does not seem likely that so highly developed a degree of co-operative efficiency can long be confined to the limits of any one country. Quite possibly our own workers may in due time meet, with their own work and their own resources, their needs for housing in a way to do credit to the great initiative of the Federal government undertaken under stress of war.



**Seventeenth and
Eighteenth
Century Design
Books.**

Reference has been made before in these columns to a broad movement under way for an improvement in the standards of design and craftsmanship in the industrial and decorative arts. This movement finds its expression in the efforts of schools, museums and publishers to acquaint the public with original sources of inspiration for good design, and it is interesting to follow the various positive efforts which are being made through these agencies from time to time in behalf of the cause.

An exhibition has recently been opened at the Metropolitan Museum of Art to run through May and June, which gives a taste of the abundance of inspiration to be found in the design books of the seventeenth and eighteenth centuries. In the three galleries devoted to the exhibition are arranged a large group of engraved plates and books issued by the designers whose influence upon the industrial and decorative art of their time finds little counterpart in that of the designers of today. Issued sometimes in book form, monumental works brought out under royal patronage, or as plates individually or in series, these ingenious and luxuriant designs were used directly by the architects, decorators, workers in both precious and base metals, furniture makers and all of the allied crafts as a basis for the design of the work which they executed. Some of the books, issued with another purpose as well, constitute a record of the executed work itself.

The choice of the material is so broad that it has been necessary strictly to limit its selection in the main to the eighteenth century in France and England, a period prolific in this type of material. There are shown a large number of plates and books

by the most skillful and influential designers, while in the same room are placed actual examples of works adapted from these designs. The careful student by comparing the designs with the work as carried out will discover in what manner the early makers of furniture, ironwork, laces, textiles, painted and carved woodwork, ormolu and jewelry interpreted the paper designs which were circulated among them, and from the individual treatment which these craftsmen used in adapting these designs to their materials there lie many suggestions which may lead modern craftsmen into ways of fame and excellence.

The smallest group is composed of designs originating in the sixteenth and seventeenth centuries in Italy, Germany and Flanders, when the spirit of the renaissance was still active but running strongly toward the so-called modern types which were developed to their full in the eighteenth century. Some remarkable pen, ink and wash drawings have for their subject elaborate seventeenth century ceilings with stucco and painted decoration, wall treatments for church interiors and one church façade of the Jesuit type. A Dürer woodcut is echoed in a large sculptured panel which has formed part of a church interior. Designs by Holbein and Dürer for ecclesiastical silver are shown near to actual works almost identical in detail, and two pieces of Italian majolica are decorated with scenes reproducing popular paintings or engravings of the day. The early editions of Vignola, Vitruvius and Palladio strike a familiar chord in every architect's mind and they are surrounded by contemporary works whose interest is not lessened by the contrast.

By far the larger group of material covers the development of decorative art in France. As in all such art, the architecture forms the point of departure for the style

of the lesser arts. Great volumes of rich designs typify the works of the successful architects of France in the seventeenth and eighteenth centuries, beginning with Jacques Androuet de Cerceau, Jules-Hardouin Mansart and the designs for interiors by Le Pautre. The most important name of the early eighteenth century in France is that of Jacques Francois Blondel, whose volumes record for us the more elaborate dwellings of a time when a very marked change was coming into house planning concomitant with the revolt against the stateliness and formality of the period of Louis XIV and expressing the desire for individual comfort and freedom which we find in the later Regency and Louis XV. work. Here are the well developed germs of the rational and beautiful planning which is connected always with our thought of French architecture. After Blondel comes a long line of resourceful architects and decorators, throughout the reigns of Louis XV. and Louis XVI., ending in the adaptations of classic in the designs of Delafosse and the architects enthused by Piranesi and its emasculation in the decorations of Percier and Fontaine. The riotously fanciful plates of Pillemont and the rocaille and coquille fountains of Boucher typify a certain playful and humorous element whose influence is seen in the metal work, textiles and lacquers of their time.

The third group covers in a similar way the period in England when the use of mahogany was well under way and fashions in furniture and decoration were changing as rapidly as fashions in clothes. The early years of the century find in vogue the group of architect-decorators Swan, Kent and Batty Langley, all of whom show an equal interest in their architecture, decoration and furniture, somewhat to the injury of the latter. Toward the middle of the century Chippendale looms large on the horizon, and while wielding considerable influence of his own, seems to have responded promptly to the changing winds of fashion. His actual work carries us into the second half of the century, when Robert Adam returning from his Italian sojourn and his association with Piranesi brought into favor the classic treatments in detail and the attenuation in proportion which were followed until the end of the century by such cabinet makers as Sheraton and Heppelwhite.

All through these centuries of activity in the decorative arts we see a continuous borrowing and stealing between Italy and

France, France and England, England and Italy. Piranesi's influence was strikingly direct both in his classic treatments carried over into England by the Adams and his introduction of Egyptian motifs, whose use characterized so much of the decoration of the Empire style.

The collection of material assembled in this exhibition is full of the most helpful suggestion to architects and designers. It forms a running contemporary comment upon the life of the generations not long preceding us, and in telling us how they did what they did it preaches a timely sermon.

CHARLES OVER CORNELIUS.

The Groundplot in Relation to the Height and the Size of a Building.

There exists a certain relation between the size of the groundplot on which a residence or a public building or any other building is built and the height and size of the building itself.

Or vice versa probably, for as a rule the groundplot is the known quantity and the designing architect should consider it in regard to the size of the building he is going to put on it.

Not always is this relation studied. Every city, every town, has examples of fine residences built on groundplots too small to bring out the beauties and characteristics of the design. And not only is this the case with residences, but often public buildings of considerable importance suffer from the same defect. It often must be a great disappointment to the architect of a building to realize, after it is built, that his carefully studied front is visible only from a point across the street where trees and other street objects hide the view of it, or to discover a fine side elevation hidden by the building on a neighboring place.

The relation between building and groundplot is minimum as far as the plot is concerned. Below this minimum the building will be actually damaged. There is no maximum, it is safe to say. A cottage may look well even as the only building in a large park. We may, subconsciously, make a financial comparison between the value of the cottage and the park it is placed in, but our judgment in this case is not based on an esthetic principle. To get clearness of detail the observer may have to come close up to the building, but the general design is visible as far as the eyesight reaches.

A person standing at the base of a three

hundred foot high tower gets no better comprehension of the tower design than a man traveling to the top in the elevator inside. He may realize the beauty of the details of the base, but not even the straining of his neck muscles will reveal to him the general design. To get a clear impression of the tower design one has to stand away from it at a considerable distance. This is well illustrated in the picture of the tower accompanying this article; the people at the foot can hardly see more than the entrance design.

This distance, which decides the minimum size of the groundplot in most cases, depends directly on the angle of sight or the field covered with the two eyes. Scientists have found that one eye will see 90 degrees to the temple side and 55 degrees to the nasal side of a certain point and also 55 degrees above and below it. The two eyes overlapping would then cover a field of 110 degrees horizontally as well as vertically. Actual observation shows this angle to be far less. The angles mentioned cover a field that with much exertion of the eyes can be seen, not what is seen in one easy glance. Resting the eyes on a certain point, the field plainly and sharply visible is not over 9 to 13 degrees to each side of the point. This angle varies for the individual eye.

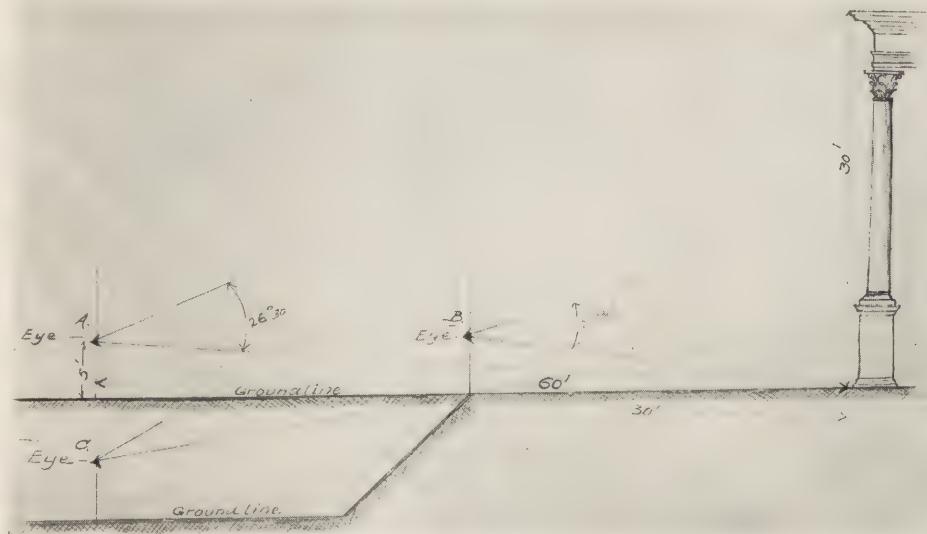
Outside of this angle, objects are only dimly visible and we realize their existence only semi-consciously. Taking 22 degrees as a mean angle of vision, 11 degrees to each side of a point looked at, we find that a tower 250 feet high should be comfortably seen at a distance of 619 feet. Experiments made with regard to the tower shown in the illustration, which is 250 feet high to the upper balustrade, proved that it was hardly well observed at a distance closer than 750 feet. At that distance it became easy to shift the eyesight and let it slowly run up the building.

The angle of clear and easy vision ranges between 19 and 26½ degrees.

Standing at a distance of 750 feet to see the 250-foot height the angle of vision is 19 degrees. The French author Ed Andre, in his book on Parks and Gardens, quotes the artist Joseph Vernet, who, speaking of the proper place to see a picture, recommends a distance away from the main object in it of twice the height, or twice the width, if the width is greater than the height. This would make an angle of 26½ degrees. This angle is shown in the sketch in Picture No. 2. A taller building will need a relatively smaller angle than a low building, and consequently a longer distance. The angle of



PICTURE No. 1.



PICTURE NO. 2-DIAGRAM SHOWING ANGLES OF CLEAR AND EASY VISION.

view of a camera lens is about 45 degrees, which accounts for the fact that a picture will show a larger field than the eye can see with one glance. Reducing these angles to proportions we can say that a building to be correctly seen should have a foreground of at least twice the height of it and, if possible, three times that height.

In viewing the width or length of a building the same angles are correct. But

in this case it is not always necessary or to advantage to see a building at right angles. Often a view at an oblique angle will be more pleasing than a view on the main axis. In buildings of unsymmetrical design often one part will make a pleasing picture without the rest and in this case the groundplot can be based on it. Of course this does not go for symmetrical designs.

S. R. DEBOER.



Handbook of Furniture Styles. By Walter A. Dyer. Being an abridged guide to the more important historic styles of furniture, especially intended for ready reference, including chronological tables, bibliography and index. Many ills., 155 pp., 5½ by 8½ inches. New York: The Century Company. Price, \$2.50 net.

University of Illinois Bulletin No. 105. Hydraulic Experiments with Valves, Orifices, Hose, Nozzles and Orifice Buckets. By Arthur N. Talbot, Fred B. Seely, Virgil R. Fleming, Melvin L. Enger. Illustrations, 80 pp., 9 by 6 inches. Published by the University of Illinois, Urbana. London: Chapman & Hall, Ltd. Price, 25 cents.

Estimating Building Costs. By William Arthur. 29 fig., 13 chapters, 211 pp., 6¾ by 4¼. New York: David Williams Company.

The Healthful House. By Lionel Robertson and T. C. O'Donnell. 12 ills., 191 pp., 9½ by 6. Battle Creek, Michigan: Good Health Publishing Co. \$2.

Interior Decoration for the Small Home. By Amy L. Rolfe, M.A. 146 pp., 7½ by 5, 33 ills. New York: The Macmillan Co. \$1.25.

Wiring for Light and Power. By Terrell Croft. 382 figures, 430 pp., 4½ by 7½. New York: McGraw-Hill Book Co., \$2.

Domestic Architecture. By L. Eugene Robinson. 50 plates, 387 pp., 7½ by 4½. New York: Macmillan Company. \$1.50.

Crosby-Fiske-Forster Hand Book of Fire Protection. By Everett U. Crosby, Henry A. Fiske and H. Walter Forster. Sixth Edition. 757 p., 7x4½ inches. New York: D. Van Nostrand Company.

National Municipal Review, Vol VIII. No. 1, January, 1919. Reconstruction Number, 107 p., 10x6¾ inches. Concord, N. H.: National Municipal League.

Drafting Room Methods, Standards and Forms. A Reference Book for Engineering Offices and Draftsmen. By Charles D. Collins. Ills., 149 p., 8½x5¾ inches. New York: D. Van Nostrand Co. Price \$2.00.

University of Illinois Bulletin. Vol. XV, May 27, 1918. No. 39 Bulletin No. 106. Test of a Flat Slab Floor of the Western Newspaper Union Building. By Arthur N. Talbot and Harrison F. Gonnerman. Ills., 52 p., 9x6 inches. Published by the University of Illinois, Urbana. London: Chapman & Hall, Ltd. Price 20c.

Lighting From Concealed Sources. A guide to better lighting methods, wherein the problems confronting the architect and lighting man are treated not only from the economic point of view, but also with full consideration for the artistic and hygienic influences. By the Engineering Department of the National X-Ray Reflector Company. J. L. Stair, Chief Engineer. Ills., 246 p., 8x10 inches. New York, Chicago, San Francisco: National X-Ray Reflector Company Price, \$2.00.



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